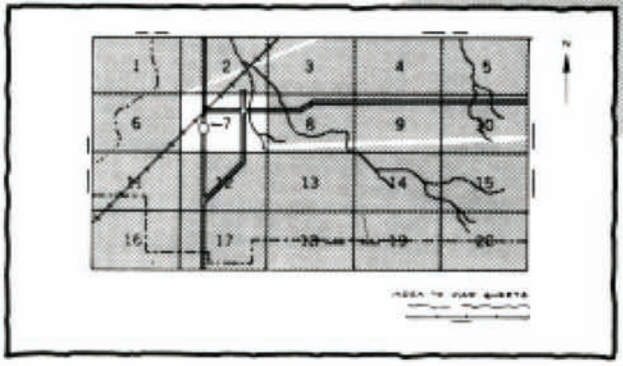
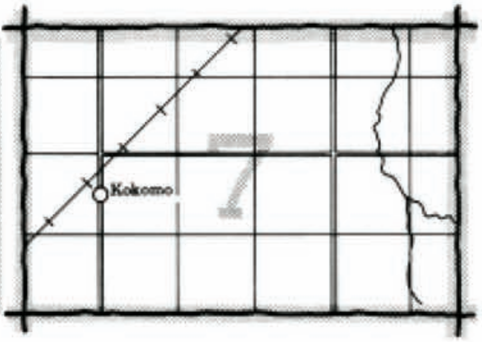
United States Department of Agriculture
Soil Conservation Service
and Forest Service
in cooperation with
Texas Agricultural Experiment Station

Soil Survey of
Jasper and Newton Counties Texas

HOW TO USE

1. Locate your area of interest on the "Index to Map Sheets"





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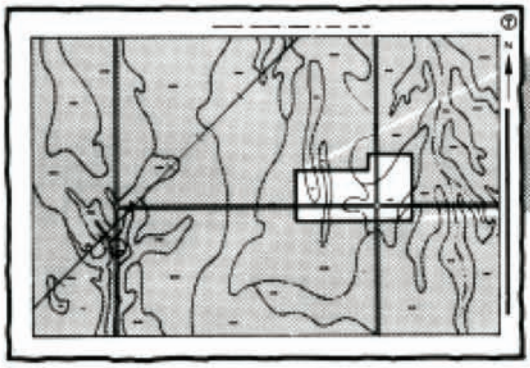
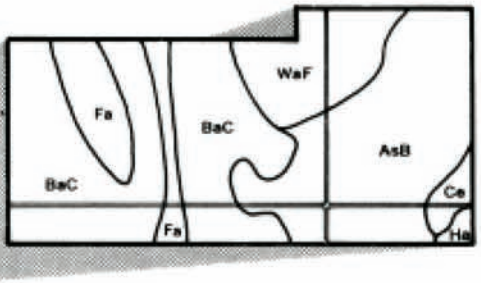
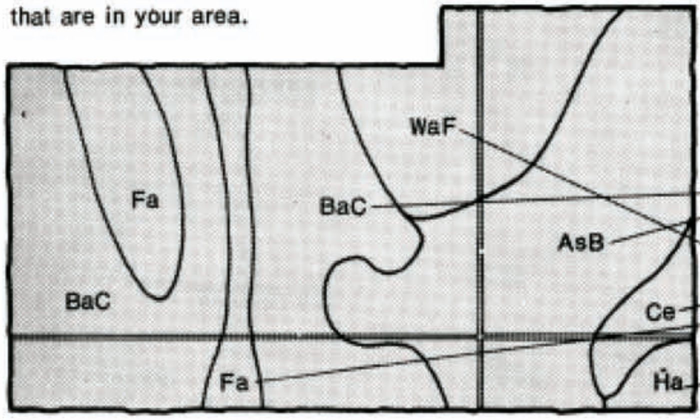




4. List the map unit symbols that are in your area.

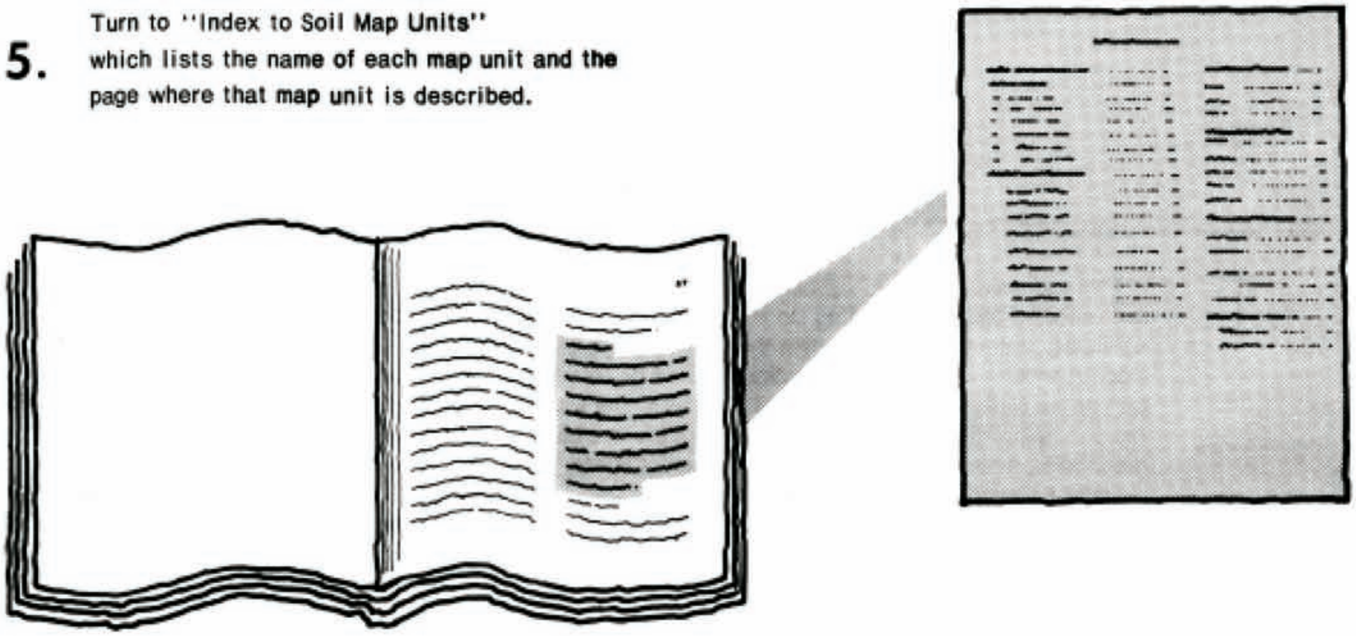


Symbols

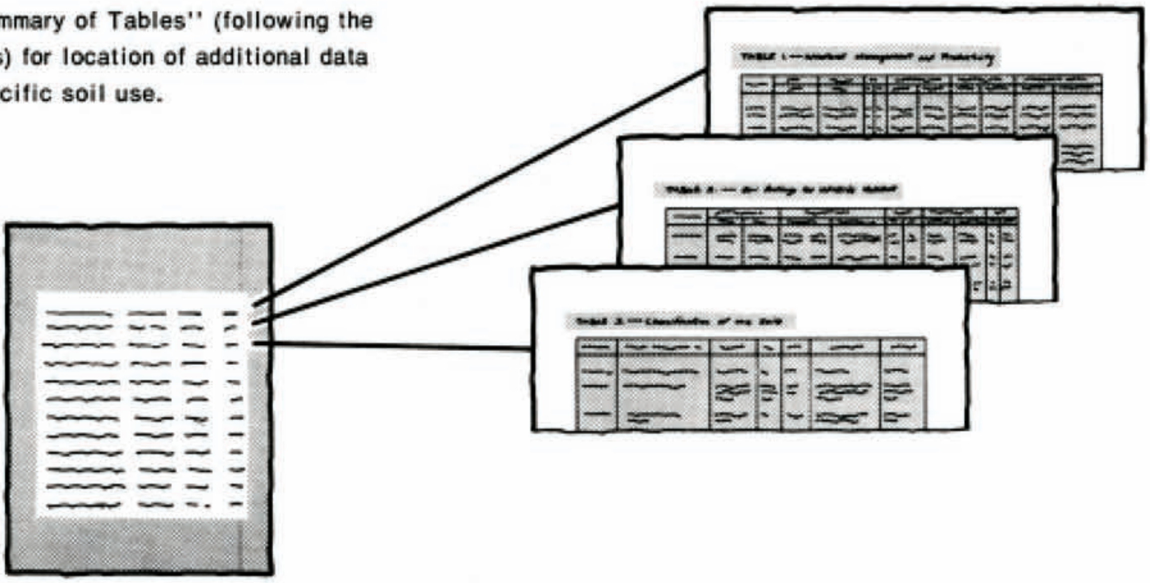
AsB
BaC
Ce
Fa
Ha
WaF

THIS SOIL SURVEY

5. Turn to "Index to Soil Map Units" which lists the name of each map unit and the page where that map unit is described.



6. See "Summary of Tables" (following the Contents) for location of additional data on a specific soil use.



7. Consult "Contents" for parts of the publication that will meet your specific needs. This survey contains useful information for farmers or ranchers, foresters or agronomists; for planners, community decision makers, engineers, developers, builders, or homebuyers; for conservationists, recreationists, teachers, or students; to specialists in wildlife management, waste disposal, or pollution control.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Experiment Stations, and local agencies. The Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was performed in the period 1973-78. Soil names and descriptions were approved in 1980. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1978. This survey was made cooperatively by the United States Department of Agriculture, Soil Conservation Service and Forest Service, and the Texas Agricultural Experiment Station. It is part of the technical assistance furnished to the Jasper-Newton Soil and Water Conservation District.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

Cover: A stand of timber in an area of the Doucette-Boykin association, undulating.

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foreword

This soil survey contains information that can be used in land-planning programs in Jasper and Newton Counties, Texas. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

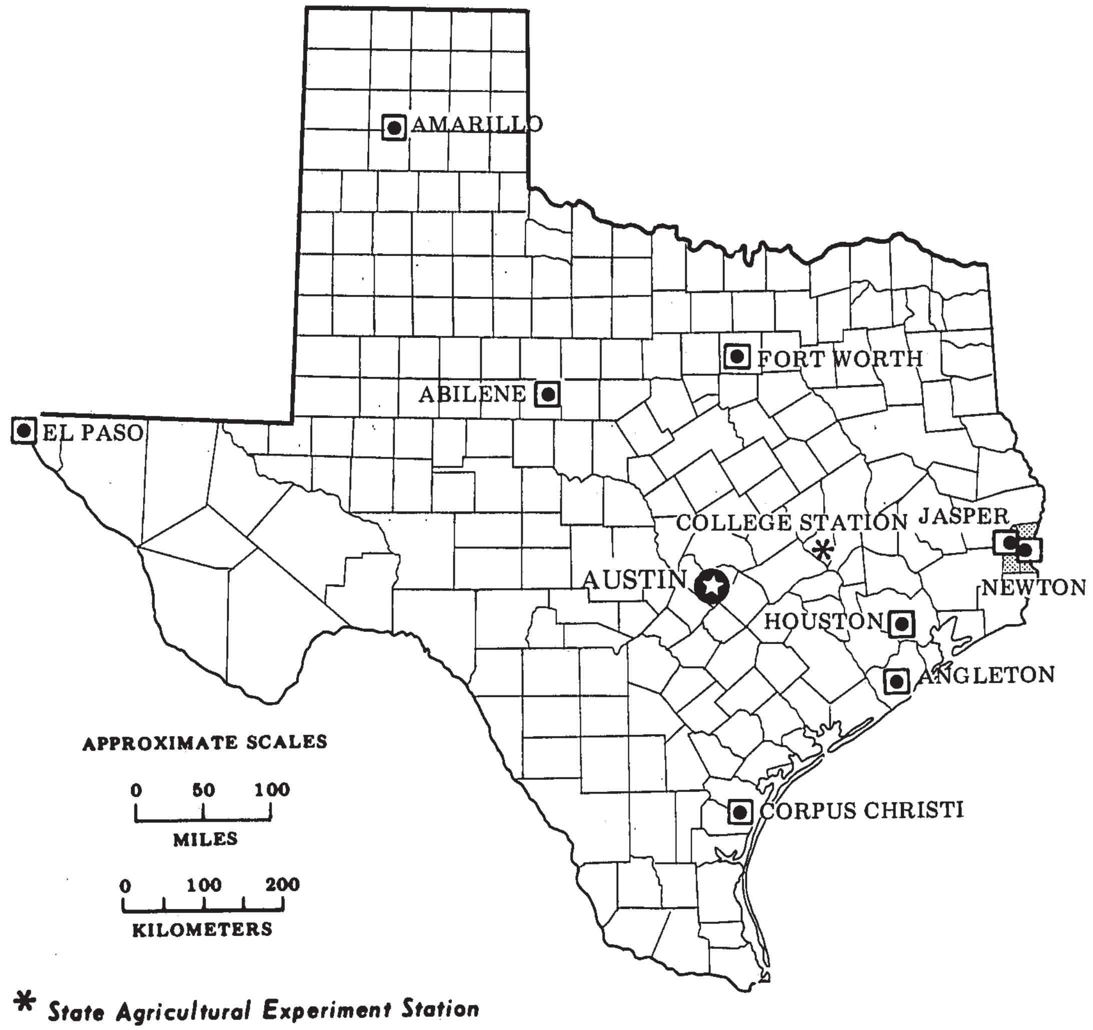
This soil survey is designed for many different users. Farmers, ranchers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to insure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Soil Conservation Service or the Cooperative Extension Service.

George C Marks

George C. Marks
State Conservationist
Soil Conservation Service



Location of Jasper and Newton Counties in Texas.

soil survey of
Jasper and Newton Counties, Texas

by Conrad L. Neitsch, Soil Conservation Service

soils surveyed by Conrad L. Neitsch, Kirby L. Griffith,
Nathan L. McCaleb, Larry F. Matula, and Don E. McKay,
Soil Conservation Service

United States Department of Agriculture,
Soil Conservation Service and Forest Service
in cooperation with
Texas Agricultural Experiment Station

JASPER AND NEWTON COUNTIES are in the extreme eastern part of Texas. The two counties have a combined area of 1,234,560 acres, including water areas. The landscape ranges from sandy, rolling hills in the northern part to wet, loamy flatwoods in the southern part. The counties are drained by numerous rivers and streams, including the Neches River, Angelina River, and Sabine River. The elevation ranges from 600 feet in the northern part of the survey area to slightly less than 10 feet in the bottom lands in the southern part of the survey area.

Jasper, the county seat of Jasper County, is in the north-central part of the county. The town serves the timber and lumber products industry. The population in 1970 was 6,397 and is gradually increasing.

Newton, the county seat of Newton County, is in the north-central part of the county about 15 miles west of the Texas-Louisiana border. The population in 1970 was 1,363 and is gradually increasing.

The timber industry is important to the economy of Jasper and Newton Counties. About 88 percent of the area is commercial forest land, owned mostly by a few large timber companies. The remaining 12 percent is small tracts of timber, pastureland, urban land, water areas, and other small areas in miscellaneous uses.

The two counties are in the East Texas Timberlands Land Resource Area. The soils formed under forest vegetation and are dominantly light colored, sandy, and loamy.

general nature of the survey area

This section gives general information concerning the counties. It discusses settlement and agriculture, natural resources, and climate.

settlement and agriculture

Jasper County was created in 1836 and organized in 1837 from a Mexican municipality. It was named for Sergeant William Jasper, a hero of the American Revolution.

Newton County was created and organized from Jasper County in 1846. It was named for Corporal John Newton, a companion of Sergeant William Jasper.

The first settlers in the area found the river and creek bottoms and the blackland very productive farmland. The land produced high yields of crops. Communities with farming as their major enterprise sprang up in the area.

Near the turn of the century, large lumber mills were built in the area. Lumbering remained the principal economic force of the area until about 1930, when the virgin timber stands were depleted. Cutover lands were then reforested, and better management of woodlands was instituted. With this change came the production of pulpwood and poles, as well as an increase in the production of sawlogs. Timber production is presently the counties' major agricultural and industrial concern.

natural resources

Jasper and Newton Counties have abundant supplies of timber and fresh water. Forest products from these two counties support lumbering, plywood production, furniture fabrication, and paper milling industries.

Portions of two of the state's largest lakes are in the northern part of the survey area. A part of Sam Rayburn Reservoir is in the northern part of Jasper County. The reservoir has a total area of 113,410 acres and is the largest body of water wholly within the state. The reservoir has 560 miles of shoreline. It is used for recreation, flood control, irrigation, and hydro-electric power.

Toledo Bend Reservoir is on the Sabine River between Texas and Louisiana. It is 65 miles long, covers 186,500 acres, and has 650 miles of shoreline. A part of this reservoir is in the northern part of Newton County. The reservoir is a joint venture of the two states, and it is the largest border lake in Texas.

Oil and gas production in the survey area is limited. The major area of production is in the southern part of the area.

climate

Prepared by the National Climatic Center, Asheville, North Carolina.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Kirbyville, Texas, in the period 1951 to 1975. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter the average temperature is 53 degrees F, and the average daily minimum temperature is 41 degrees. The lowest temperature on record, which occurred at Kirbyville on January 12, 1962, is 8 degrees. In summer the average temperature is 81 degrees, and the average daily maximum temperature is 93 degrees. The highest recorded temperature, which occurred on August 12, 1962, is 107 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is 56 inches. Of this, 29 inches, or 52 percent, usually falls in April through September, which includes the growing season for most crops. In 2 years out of 10, the rainfall in April through September is less than 23 inches. The heaviest 1-day rainfall during the period of record was 8.62 inches at Kirbyville on September 8, 1963. Thunderstorms occur on about 60 days each year, and most occur in summer.

Snowfall is rare. In 90 percent of the winters, there is no measurable snowfall. In 10 percent, the snowfall, usually of short duration, is more than 2 inches. The heaviest 1-day snowfall on record was more than 6 inches.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 90 percent. The sun shines 70 percent of the time possible in summer and 50 percent in winter. The prevailing wind is from the south. Average windspeed is highest, 12 miles per hour, in spring.

Severe local storms, including tornadoes, strike occasionally in or near the area. They are short and cause variable and spotty damage. Every few years, in summer or autumn, a tropical depression or remnant of a hurricane that has moved inland causes extremely heavy rains for one to three days.

how this survey was made

Soil scientists made this survey to provide information about the soils in the survey area—where they are and how they will behave for specified land uses. They observed the steepness, length, and shape of slopes; the general pattern of drainage; the kinds of native plants or crops; and the kinds of rock. In order to describe the soils, they dug many holes to study soil profiles. A profile is the sequence of natural layers, or horizons, in a soil. It extends from the surface down into the parent material, which has been changed very little by natural weathering processes or plant roots.

The soil scientists recorded the characteristics of the profiles they studied and compared those profiles with representative profiles of known soils in nearby counties and in more distant places. They then classified and named the soils in the survey area. They drew the boundaries of the soils on aerial photographs. These photographs show trees, buildings, fields, roads, and other details that help in drawing boundaries accurately. The soil maps at the back of this publication were prepared from aerial photographs.

The areas shown on a soil map are called map units. Most map units in Jasper and Newton Counties are made up of two kinds of soil. Some are made up of one kind. These map units are described under "General soil map units" and "Detailed soil map units."

While a soil survey is in progress, samples of some soils are collected for laboratory analyses and for engineering tests. All soils are field tested to determine their characteristics. Interpretations of those characteristics are made during the survey. Data are assembled from other sources, such as test results, records, field experience, and state and local specialists. For example, data on crop yields under defined management are assembled from farm records and from field or plot experiments on the same kinds of soil.

But only part of a soil survey is done when the soils have been named, described, interpreted, and delineated on aerial photographs and when the laboratory data and other data have been assembled. The mass of detailed information then needs to be organized so that it can be used by farmers, rangeland and woodland managers, engineers, planners, developers and builders, home buyers, and others.

soil classification and soil mapping

After describing the soils in a survey area and measuring or characterizing their properties, soil scientists systematically classify the soils into taxonomic classes that have a specified range of characteristics and behavior. The system of taxonomic classification used for soils in the United States, presented in Soil Taxonomy (*14*), has categories that are based mainly on the kind and character of soil properties and the arrangement of soil horizons within the profile. Once the individual soils in a survey area are classified, they can be compared and correlated with similar soils in the same taxomomic class that have been recognized in other areas.

Soils occur on the landscape in an orderly pattern that is related to the geology and the landforms and vegetation. Each kind of soil is associated with a particular kind or segment of landscape. By observing and describing the soils in the survey area and relating their occurrence to specific segments of landscape, the soil scientists can evolve a concept or model of how soils formed and developed on the landscape. During mapping, this model enables him to accurately predict the location of specific soils on the landscape.

Individual soils on the landscape often merge into one another with gradual changes in characteristics. To construct an accurate soil map, the soil scientist must judge where the boundaries between the soils occur. He can observe only a limited number of soil profiles. Compared to the whole three-dimensional soil volume, the places examined are little more than points. These few observations, however, supplemented by the model of the soil-landscape relationship, are sufficient to verify the soil scientist's predictions of the kinds of soils and the location of their boundaries. In practice, the delineated soil map units are based on inferences derived from this small sample.

soil variability and map unit composition

A map unit delineated on a soil map to represent an area of a certain kind of soil is named and identified in terms of that soil's taxonomic classification. A taxonomic class is a concept in a system of classification that has precise, defined limits. The soil on the landscape, however, is a natural object. In common with other natural objects, it has a characteristic variability or scatter of its properties. Thus, a map unit will have small areas of soils with properties that are outside of those defined class limits. Each map unit is made up of the soil, or soils, for which it is named plus a small proportion of soils that belong to other taxonomic classes. These areas of differing soils are called inclusions.

Some inclusions in map units occur because the limited number of observations that the soil scientist can make is inadequate to determine the presence of all the kinds of soils on the landscape, especially when the soil pattern is complex. Other inclusions occur because the map scale is too small for the soil scientist to precisely show small areas of soils. Since most inclusions have properties and behavioral patterns similar to those of the dominant soil or soils in the map unit, their presence does not affect use and management. Some inclusions, however, have properties and behavior divergent enough to require different use or management. These are contrasting soil inclusions and are listed in the map unit description. Although their properties are not noted in the description, their position on the landscape is mentioned. This allows the soil survey user to recognize them on the landscape, even though they are not shown on the map.

The presence of inclusions in a map unit in no way diminishes the usefulness or accuracy of the soil survey. The objective of soil mapping is not to delineate pure taxonomic classes of soils, but to separate the landscape into units that have similar use and management requirements. The map's approximation of such units provides sufficient information to allow the development of resource plans, but onsite investigation is needed to plan for specific uses.

confidence limits of soil survey information

The statements about soil behavior in this survey can be thought of in terms of probability: they are predictions of soil behavior. The behavior of a soil depends not only on its own properties, but on responses to such variables as climate and biological activity. Soil conditions are predictable for the long term, but they are unpredictable from year to year. For example, while a soil scientist can state that a given soil has a high water table in most years, he can not say with certainty that the water table will be present next year.

Confidence limits of soil surveys are statistical expressions of the probability that the composition of a map unit or a property of the soil will vary within prescribed limits. Confidence limits can be assigned numerical values based on a random sample. In the absence of specific data to determine confidence limits, the natural variability of soils and the way soil surveys are made must be considered. The composition of map units and other information is derived largely from extrapolations made from a small sample. The map units contain contrasting inclusions. Also, information about the soils does not extend below a depth of 5 or 6 feet. The information presented in the soil survey is not meant to be used as a substitute for onsite investigations. Soil survey information can be used to select from among alternative practices or general designs that may be needed to minimize the possibility of soil-related failures. It cannot be used to interpret specific points on the landscape.

Specific confidence limits for the compositions of the soil associations and soil complexes in Jasper and Newton Counties were determined by taking samples from random transects made across mapped areas. The sample data was statistically summarized. Soil scientists made enough transects and took enough samples to characterize the delineated associations and complexes at an 80 percent confidence level. This means, for example, that in 80 percent of the areas mapped as Newco-Urland association, hilly, the percentage of the soils will be within the range given in the map unit description. In as many as 20 percent of the mapped areas of this association, the percentage of any of the soils can be either higher or lower than the given range.

The composition of most of the other map units in this survey is based on the judgment of the soil scientist and was not determined by a statistical procedure.

Most of the soils in Jasper and Newton Counties are used as forest land. These soils are mapped as associations and complexes over broad areas and landscapes. In a few places the soils are used for residential development or other intensive uses. These soils are mapped in greater detail.

general soil map units

The general soil map at the back of this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, a map unit consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one unit can occur in other units but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

The land area of the 11 general soil map units makes up about 97 percent of the total acreage of Jasper and Newton Counties. The remaining 3 percent is water areas.

loamy and sandy soils of the uplands

This group of soils makes up about 36 percent of the survey area. The major soils are the Pinetucky, Shankler, Doucette, Tehran, Letney, Rayburn, and Kisatchie soils. These gently undulating to hilly soils of the uplands have loamy and sandy surface layers and loamy and clayey underlying layers. They are moderately well drained to somewhat excessively drained. Permeability is very slow to moderately rapid.

Most areas of these soils are in woodland. The soils have medium or high potential for the production of pine trees. The principal trees are loblolly, shortleaf, and longleaf pines.

Some areas are used for pasture. Improved pasture is bahiagrass or bermudagrass. Some pastures are planted to spring legumes, such as crimson clover, arrowleaf clover, or vetch.

The soils have medium or low potential for urban uses because of slope, shrinking and swelling with changes in moisture content, and wetness.

1. Pinetucky-Shankler-Doucette

Gently undulating to hilly, deep, loamy and sandy, moderately well drained to somewhat excessively drained soils

This map unit makes up about 15 percent of the survey area. It is 24 percent Pinetucky soils, 14 percent Shankler soils, 13 percent Doucette soils, and 49 percent other soils (fig. 1).

Pinetucky soils are moderately well drained. They are on broad, gently undulating and undulating uplands. Typically, the surface layer is fine sandy loam about 13 inches thick. It is grayish brown in the upper part and yellowish brown in the lower part. The subsoil to a depth of 80 inches is sandy clay loam that is strong brown in the upper part, yellowish brown in the middle part, and brownish yellow in the lower part. The soil is very strongly acid throughout.

Shankler soils are well drained and somewhat excessively drained. They are on the middle and lower slopes of broad, undulating to hilly areas. Typically, the surface layer is loamy fine sand about 12 inches thick. It is dark brown in the upper part and brown in the lower part. The next layer to a depth of 43 inches is loamy fine sand that is light yellowish brown in the upper part and very pale brown in the lower part. The subsoil extends to a depth of 80 inches. It is sandy clay loam that is red in the upper part and yellowish red in the lower part. The soil is very strongly acid throughout.

Doucette soils are well drained. They are on broad, undulating interstream divides. The surface layer is medium acid and strongly acid, brownish loamy fine sand about 24 inches thick. The subsoil to a depth of 80 inches is very strongly acid sandy clay loam. It is brownish in the upper part and yellowish in the lower part. The lower part is about 6 percent plinthite.

Other soils in this map unit are Urland, Bonwier, and Stringtown soils, which are mostly on ridgetops and upper side slopes. Boykin soils are typically on lower slopes, but small areas are on upper slopes. Newco soils are on side slopes. Bleakwood, Iuka, and Mantachie soils are on bottom lands.

Most areas of this map unit are used for timber production, woodland grazing, and pasture. Most of the soils in this map unit have high potential for pine trees.

The main limitations are droughtiness and slope. Most of the soils have very high potential for pasture. However, some of the soils have medium potential for pasture because of droughtiness.

The potential for urban uses is medium. Low strength and steepness of slope are the main limitations. The potential for recreational uses is medium because of slope and the moderately slow permeability of the Pinetucky soils.

2. Tehran-Letney

Undulating to hilly, deep, sandy, well drained and somewhat excessively drained soils

This map unit makes up about 13 percent of the survey area. It is 41 percent Tehran soils, 40 percent Letney soils, and 19 percent other soils (fig. 2).

Tehran soils are somewhat excessively drained. They are on side slopes of hills and ridges. Typically, these soils have a strongly acid surface layer of loamy sand about 13 inches thick. It is dark grayish brown in the upper part and brown in the lower part. The next layer to a depth of 51 inches is strongly acid and very strongly acid, light yellowish brown loamy sand. The subsoil is very strongly acid sandy clay loam to a depth of 75 inches or more. It is reddish yellow in the upper part and mottled brown, red, and gray in the lower part.

Letney soils are well drained. They are on broad ridges and side slopes. Typically, these soils have a very strongly acid surface layer of dark grayish brown loamy sand about 7 inches thick. The next layer to a depth of 34 inches is very strongly acid, pale brown loamy sand. The subsoil extends to a depth of 75 inches or more. It is very strongly acid sandy clay loam that is strong brown in the upper part and reddish yellow in the lower part.

Other soils in this map unit are Doucette, Urland, Newco, and Melhomes soils. Doucette and Urland soils are on ridgetops. Newco soils are on side slopes above drainageways, and Melhomes soils are in drainageways.

Most areas of this map unit are used for timber production and woodland grazing. A few areas are in pasture. The potential for pine trees is medium. The main limitation is a droughty, sandy surface layer. These soils have low potential for pasture and hayland plants.

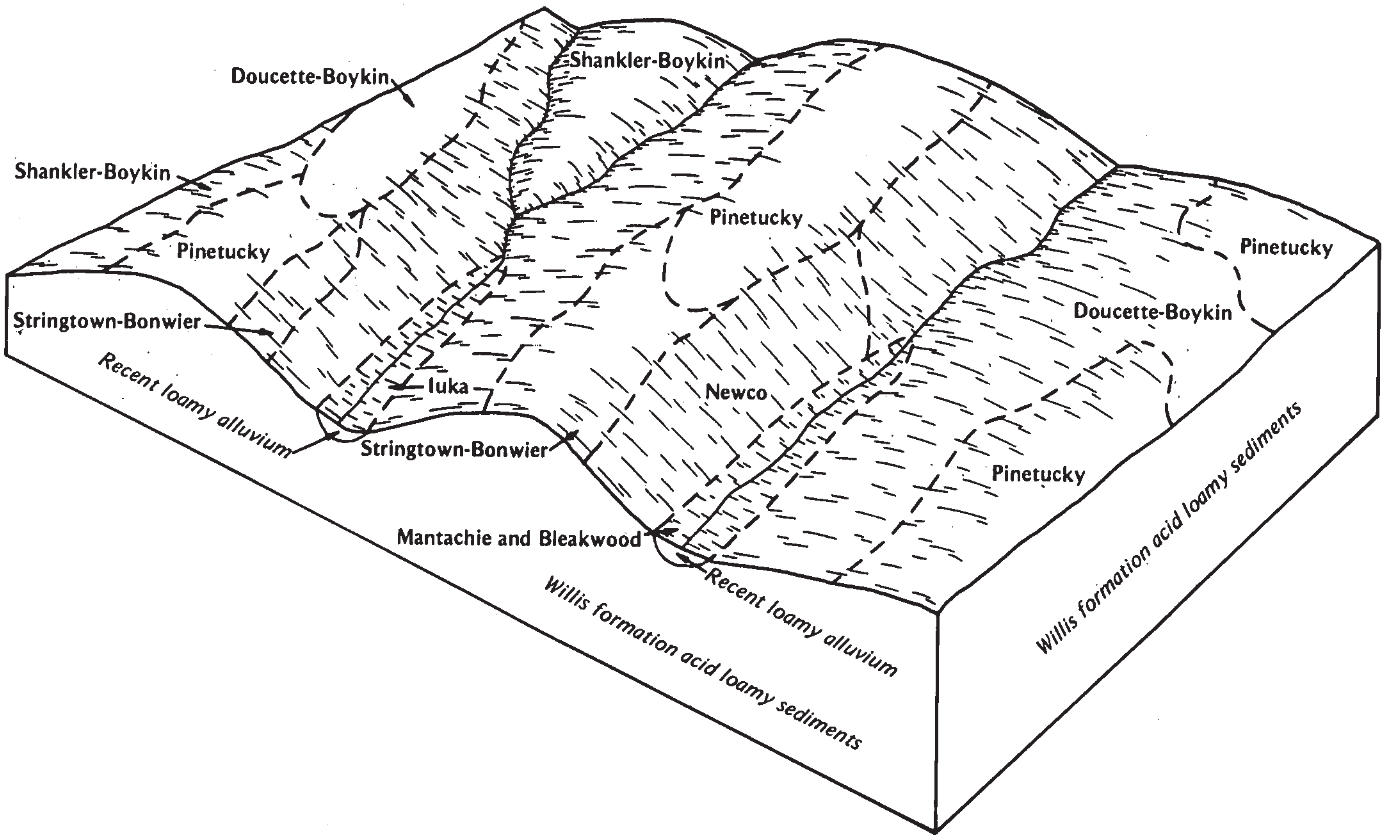


Figure 1.—Pattern of soils and underlying material in the Pinetucky-Shankler-Doucette general soil map unit.

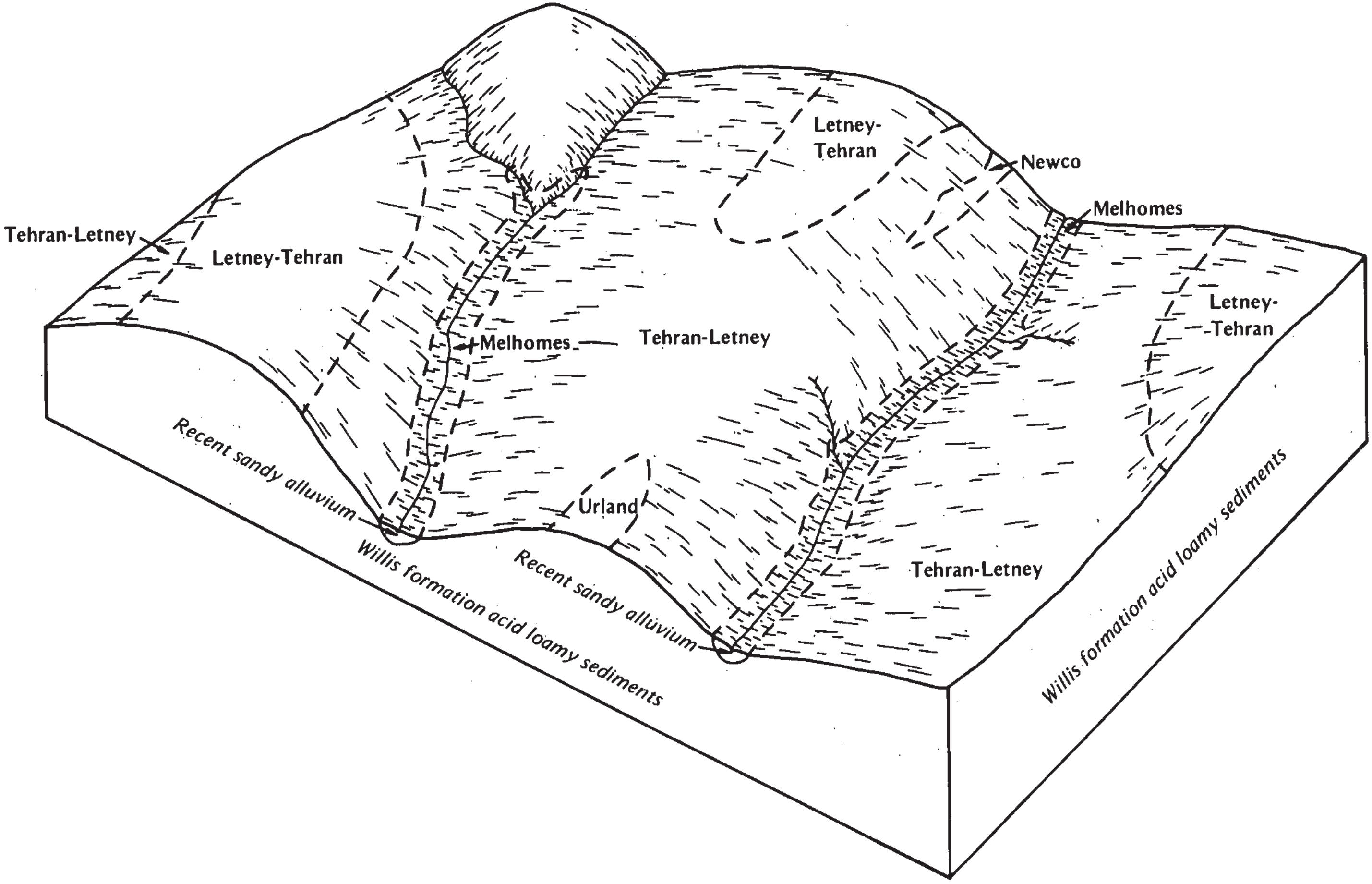


Figure 2.—Pattern of soils and underlying material in the Tehran-Letney general soil map unit.

Droughtiness is the main limitation. The potential for urban and recreational uses is low. Slope and sandy textures are the main limitations.

3. Rayburn-Tehran-Kisatchie

Gently undulating to hilly, moderately deep and deep, loamy and sandy, moderately well drained to somewhat excessively drained soils

This map unit makes up about 8 percent of the survey area. It is about 18 percent Rayburn soils, 14 percent Tehran soils, 14 percent Kisatchie soils, and 54 percent other soils (fig. 3).

Rayburn soils are moderately well drained. They are on gently undulating to hilly ridgetops and upper side slopes. Typically, the surface layer is strongly acid fine sandy loam about 7 inches thick. It is very dark grayish brown in the upper part and dark grayish brown in the lower part. The subsoil to a depth of 55 inches is very strongly acid clay. The subsoil is red in the upper part and is mottled in shades of brown, red, and gray in the lower part. The underlying material to a depth of 65 inches is weakly consolidated sandstone.

Tehran soils are somewhat excessively drained. They are mostly on upper side slopes and ridgetops. Typically, these soils have a strongly acid surface layer of loamy sand about 13 inches thick. It is dark grayish brown in the upper part and brown in the lower part. The next layer to a depth of 51 inches is strongly acid and very strongly acid, light yellowish brown loamy sand. The subsoil to a depth of 75 inches is very strongly acid sandy clay loam. The subsoil is reddish yellow in the upper part and mottled strong brown, red, yellowish red, and light gray in the lower part.

Kisatchie soils are well drained. They are mostly on side slopes above drainageways. Typically, the surface layer is very strongly acid fine sandy loam about 5 inches thick. It is dark grayish brown in the upper part and grayish brown in the lower part. The subsoil extends to a depth of 35 inches. It is very strongly acid clay that is grayish brown in the upper part, light brownish gray in the middle part, and light gray in the lower part. The underlying material is light brownish gray siltstone.

Other soils in this map unit are Browndell, Tahoula, Doucette, Letney, Corrigan, Mantachie, Bleakwood, and Melhomes soils. Browndell, Tahoula, Doucette, Letney, and Corrigan soils are on landscape positions similar to those of the major soils of this map unit. Melhomes, Mantachie, and Bleakwood soils are in drainageways.

Most areas of this map unit are used for timber production and woodland grazing. The potential for pine trees is medium. The potential for pasture and hayland plants is low. The main limitation on Rayburn and Kisatchie soils is the dense, clayey subsoil. The main limitation on Tehran soils is the droughty, sandy surface layer.

The potential is low for urban uses of most of the soils of this map unit. The shrinking and swelling of the soil with changes in moisture content, wetness, and slope are the main limitations. The potential for recreational uses is low, mainly because of the very slow permeability of the Rayburn and Kisatchie soils, wetness, and slope.

loamy soils of the flatwoods

This group of soils makes up about 32 percent of the survey area. The major soils are the Malbis, Kirbyville, Evadale, and Gist soils. These nearly level and gently undulating soils of the uplands have loamy surface layers over loamy and clayey underlying layers. They are

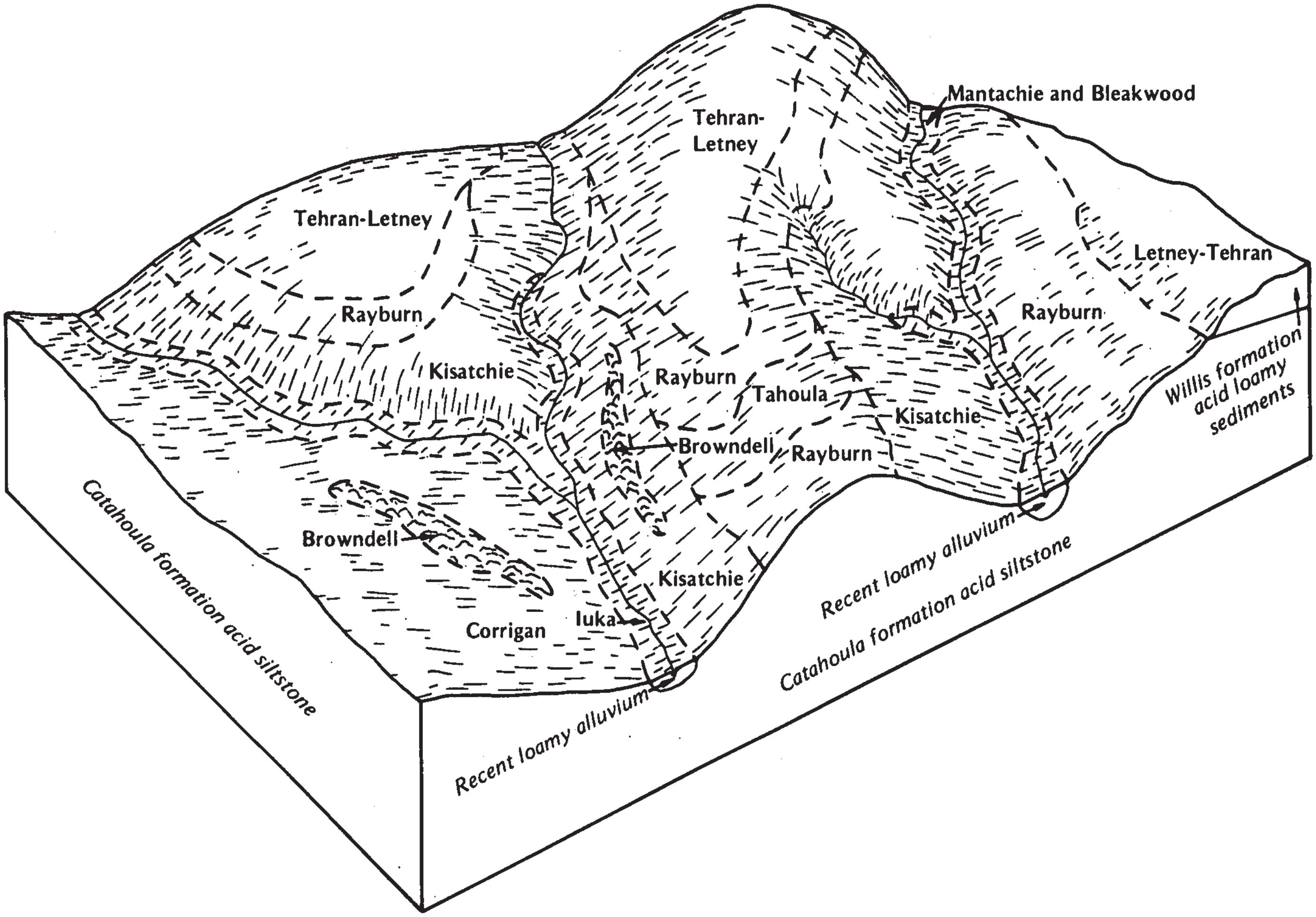


Figure 3.—Pattern of soils and underlying material in the Rayburn-Tehran-Kistachie general soil map unit.

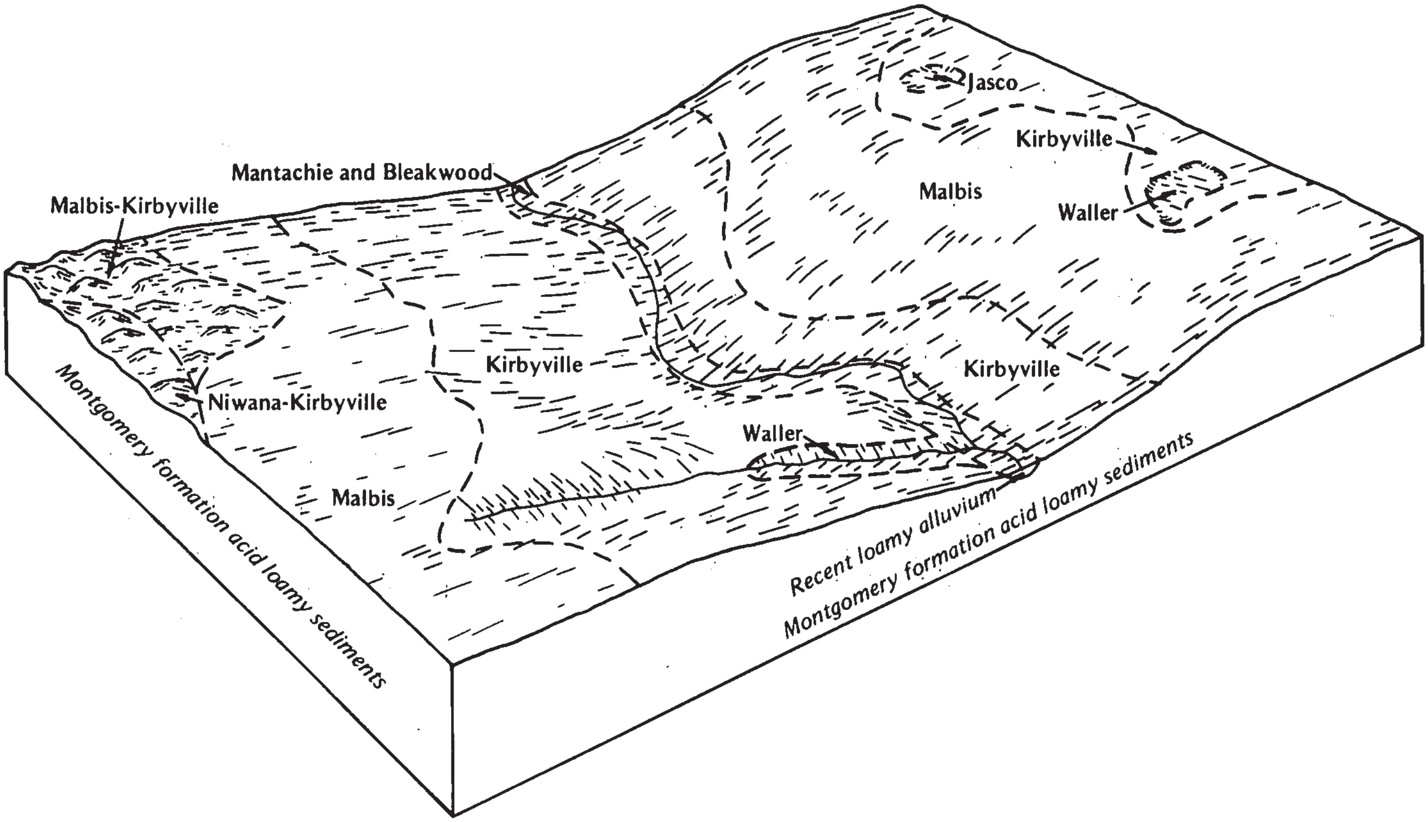


Figure 4.—Pattern of soils and underlying material in the Kirbyville-Malbis general soil map unit.

poorly drained to moderately well drained. Permeability is very slow to moderate.

Most areas of these soils are in woodland. The soils have very high potential for the production of pine trees. The principal trees are loblolly, slash, and longleaf pines.

Some areas are used for pasture. Improved pasture is bahiagrass or bermudagrass. Some pastures are planted to spring legumes, such as crimson clover, white clover, or singletary peas.

The soils have medium or low potential for urban uses because of wetness and low strength.

4. Kirbyville-Malbis

Gently undulating, deep, loamy, somewhat poorly drained and moderately well drained soils

This map unit makes up about 14 percent of the survey area. It is about 36 percent Kirbyville soils, 29 percent Malbis soils, and 35 percent other soils (fig. 4).

Kirbyville soils are somewhat poorly drained. They are on concave surfaces in areas between mounds. Typically, the surface layer is medium acid fine sandy loam about 12 inches thick. It is light brownish gray in the upper part and light yellowish brown in the lower part. The subsoil extends to a depth of 65 inches or more. It is strongly acid, brownish yellow sandy clay loam that has streaks of fine sandy loam to a depth of 38 inches, and very strongly acid, brownish yellow sandy clay loam to a depth of 65 inches.

Malbis soils are moderately well drained. They are mostly on low mounds. Typically, the surface layer is medium acid, grayish brown fine sandy loam about 5 inches thick. The next layer to a depth of 24 inches is strongly acid, light yellowish brown fine sandy loam. The subsoil extends to a depth of 72 inches or more. The upper part to a depth of 48 inches is very strongly acid, brownish yellow sandy clay loam mottled with red. The lower part is very strongly acid, brownish yellow sandy clay loam.

Other soils in this map unit are Jasco, Waller, Niwana, and Evadale soils. Jasco soils are in low, depressional areas. Waller and Evadale soils are in small drains. Niwana soils are on mounds.

Most areas of this map unit are used for timber production and woodland grazing. Many areas are in pasture. The potential for pine trees and pasture is very high. The potential for urban uses is medium because of wetness. The potential for recreational uses is medium because of wetness and moderately slow permeability of the Malbis soil.

5. Evadale-Gist

Nearly level and gently undulating, deep, loamy, poorly drained and moderately well drained soils

This map unit makes up about 14 percent of the survey area. It is about 56 percent Evadale soils, 16 percent Gist soils, and 28 percent other soils (fig. 5).

Evadale soils are poorly drained. They are in intermound areas. Typically, the surface layer is silt loam about 10 inches thick. It is dark grayish brown in the upper part and grayish brown in the lower part. The subsoil to a depth of 70 inches is gray silty clay loam in the upper few inches and gray clay below. The subsoil is about 25 percent by volume streaks and tongues of silt loam. It has brownish, reddish, and yellowish mottles. The soil is very strongly acid throughout.

Gist soils are moderately well drained. They are on round to oblong mounds that are 15 to 40 inches high and 75 to 250 feet across. Typically, the surface layer is strongly acid, dark grayish brown very fine sandy loam about 4 inches thick. The next layer to a depth of 16 inches is strongly acid, light yellowish brown very fine sandy loam. The upper part of the subsoil to a depth of 41 inches is strongly acid and very strongly acid, yellowish brown loam. The lower part of the subsoil to a depth of 70 inches is very strongly acid clay loam that grades to clay at a depth of about 50 inches.

Other soils in this map unit are Waller soils in drainageways and depressional areas and Vidrine soils on low mounds.

Areas of this map unit are used mainly for timber production and woodland grazing. A few areas are in pastureland. The soils of this map unit have very high potential for pine and hardwood trees. The soils have low potential for pasture. The main limitation is wetness.

The potential for urban uses is low. Wetness is the main limitation. Low strength is a limitation for local roads and streets. The potential for recreational uses is low because of wetness and very slow permeability.

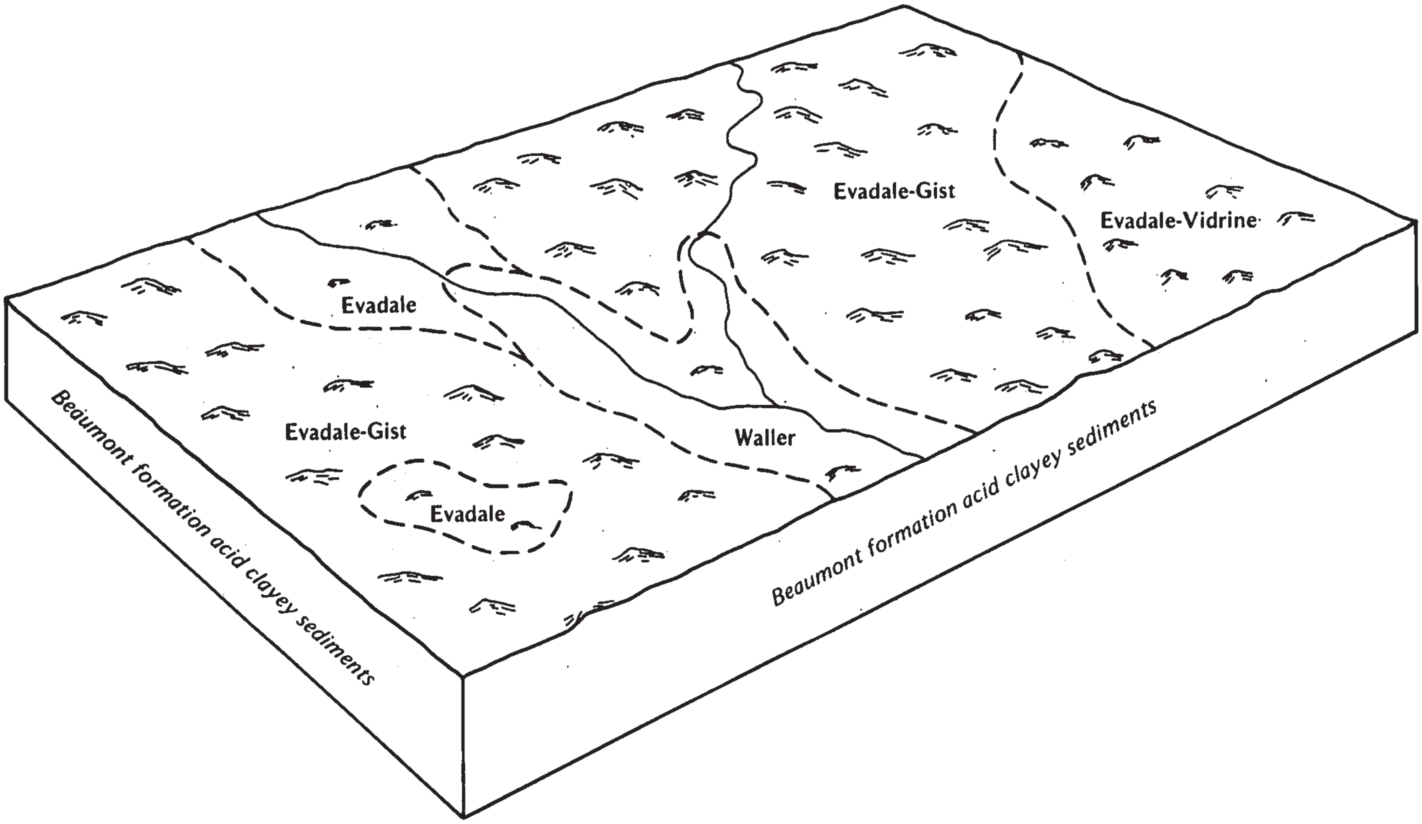

Evadale-Gist
Evadale-Vidrine
Evadale
Waller
Evadale-Gist
Evadale
Beaumont formation acid clayey sediments
Beaumont formation acid clayey sediments

Figure 5.—Pattern of soils and underlying material in the Evadale-Gist general soil map unit.

6. Malbis

Gently undulating, deep, loamy, moderately well drained soils

This map unit makes up about 4 percent of the survey area. It is 66 percent Malbis soils and 34 percent other soils.

Malbis soils are on broad to linear, slightly ridged areas. Typically, the surface layer is strongly acid sandy loam about 13 inches thick. It is dark grayish brown in the upper part and grayish brown in the lower part. The subsoil to a depth of 72 inches is strongly acid and very strongly acid, yellowish brown sandy clay loam. The subsoil has reddish, brownish, and grayish mottles and is about 10 percent plinthite (iron masses) in the lower part.

Other soils in this map unit are Kirbyville, Jasco, Waller, Rogan, Iuka, and Mantachie soils. Kirbyville soils are on slightly lower and wetter areas than the Malbis soils. Waller, Iuka, and Mantachie soils are in small drains. Rogan soils are on similar landscape positions as the Malbis soils. Jasco soils are in depressional areas.

Most areas of this map unit are used for timber production, woodland grazing, and pasture. The potential for pine trees and pasture is very high.

The potential for urban and recreational uses is medium because of wetness. Low strength is a limitation for local roads and streets.

clayey and loamy soils of the bottom lands

This group of soils makes up about 11 percent of the survey area. The major soils are the Urbo, Mantachie, and Iuka soils. These nearly level soils are on the bottom lands and flood plains along the major creeks and the Neches, Angelina, and Sabine Rivers. Areas of these soils are frequently flooded. The soils are clayey or loamy throughout. They are somewhat poorly drained and moderately well drained. Permeability is very slow to moderate.

Areas of these soils are used mostly for woodland. They have very high potential for the production of pines and hardwoods. The native trees are loblolly pine, shortleaf pine, water oak, willow oak, cow oak, red oak, sweetgum, white oak, and hickory. Some areas are used as pasture. Improved pasture is bahiagrass or bermudagrass. Most of these soils are not suited to urban uses because of flooding.

7. Urbo-Mantachie

Nearly level, deep, clayey and loamy, somewhat poorly drained soils

This map unit makes up about 9 percent of the survey area. It is about 33 percent Urbo soils, 27 percent Mantachie soils, and 40 percent other soils.

Urbo soils are on nearly level bottom lands. Typically, the surface layer is slightly acid, very dark grayish brown clay about 4 inches thick. The subsoil to a depth of 65 inches is very strongly acid, grayish brown clay that grades to light brownish gray in the lower part.

Mantachie soils are on slightly higher bottom lands than Urbo soils. Typically, the surface layer is strongly acid, dark grayish brown loam about 8 inches thick. The subsoil is very strongly acid and extends to a depth of 60 inches or more. It is yellowish brown sandy clay loam to a depth of 15 inches, light brownish gray sandy clay loam to a depth of 35 inches, light gray clay loam to a depth of 51 inches, and light gray fine sandy loam to a depth of 60 inches.

Other soils in this map unit are Iuka, Ochlockonee, Mooreville, and Deweyville soils. Iuka and Ochlockonee soils are on higher lying areas. Mooreville soils are on landscape positions similar to Mantachie soils. Deweyville soils are in low areas and old sloughs.

Areas of these soils are used mostly as woodland. Hardwood trees are dominant. The potential for hardwood trees is very high. The potential for pasture is medium. The main limitations are wetness and the clayey subsoil.

These soils are not suited to urban uses because of flooding and wetness. The potential for recreational uses is low because of wetness and flooding.

8. Iuka-Mantachie

Nearly level, deep, loamy, moderately well drained and somewhat poorly drained soils

This map unit makes up about 2 percent of the survey area. It is about 80 percent Iuka soils, 15 percent Mantachie soils, and 5 percent other soils.

Iuka soils are moderately well drained. They are on nearly level and slightly wavy bottom lands above streams and river channels. Typically, they have a strongly acid, brownish surface layer of fine sandy loam about 14 inches thick. The underlying material is very strongly acid, light yellowish brown fine sandy loam to a depth of 34 inches; very strongly acid, light yellowish brown loamy fine sand to a depth of 45 inches; and very strongly acid, very pale brown fine sand to a depth of 64 inches.

Mantachie soils are somewhat poorly drained. They are in the lower and wetter areas of the map unit. Typically, the surface layer is strongly acid, dark grayish brown loam about 8 inches thick. The subsoil extends to a depth of 60 inches or more. It is very strongly acid, yellowish brown sandy clay loam to a depth of 15 inches; very strongly acid, light brownish gray sandy clay loam to a depth of 35 inches; very strongly acid, light gray clay loam to a depth of 51 inches; and very strongly acid, light gray fine sandy loam to a depth of 60 inches.

Other soils in this map unit are Urbo and Bleakwood soils. The Bleakwood and Urbo soils are on landscape positions similar to those of the Mantachie soils.

Most areas of these soils are used as woodland. Hardwood trees are dominant. The potential for pine and hardwood trees is very high. The potential for pasture is high. The main limitation is wetness.

These soils are not suited to urban uses because of flooding and wetness. The potential for recreational uses is low because of flooding and wetness.

sandy and loamy soils of the terraces

This group of soils makes up 12 percent of the survey area. The major soils are Bienville, Alaga, Bernaldo, and Besner soils. These gently undulating soils on stream terraces have sandy and loamy surface layers and sandy and loamy underlying layers. They are somewhat excessively drained and well drained. Permeability is rapid to moderate.

Most areas of these soils are in woodland. The potential for the production of pine trees is very high. The principal trees are loblolly, slash, and shortleaf pines.

Some areas are used as pasture. Improved pasture is bahiagrass or bermudagrass. Some pastures are planted to spring legumes, such as crimson clover, arrowleaf clover, white clover, or vetch.

These soils have high potential for urban uses.

9. Bienville-Alaga

Gently undulating, deep, sandy, somewhat excessively drained soils

This map unit makes up about 6 percent of the survey area. It is 36 percent Bienville soils, 15 percent Alaga soils, and 49 percent other soils.

Bienville soils are mostly on broad, plane areas. Typically, the surface layer is medium acid, brown loamy fine sand about 6 inches thick. The next layer to a depth of 20 inches is strongly acid, brown loamy fine sand. The subsoil is very strongly acid loamy fine sand that is strong brown to a depth of 70 inches and pale brown to a depth of 80 inches.

Alaga soils are on gently undulating areas that lie parallel to old river meanders and oxbows. Typically, the surface layer is strongly acid, dark grayish brown loamy sand about 5 inches thick. The underlying material to a depth of 65 inches is strongly acid loamy sand that is yellowish brown in the upper part and brownish yellow in the lower part. The underlying material to a depth of 80 inches is strongly acid, light yellowish brown and light gray sand.

Other soils in this map unit are Besner, Bernaldo, Mantachie, Urbo, Iuka, Mooreville, and Mollville soils. Besner and Bernaldo soils are in long, narrow areas and are slightly lower than Alaga and Bienville soils. Mantachie, Urbo, Iuka, Mooreville, and Mollville soils are in drainageways and low, narrow sloughs.

Areas of this map unit are used mostly for timber production, woodland grazing, and pasture. The potential for pine trees is high. The main limitation is droughtiness of the surface layer. The potential for pasture is high. Droughtiness of the surface layer is a limitation.

The potential for urban and recreational uses is high. Seepage and the tendency of cutbanks to cave are limitations.

10. Besner-Bernaldo

Gently undulating, deep, loamy, well drained soils

This map unit makes up about 6 percent of the survey area. It is 45 percent Besner soils, 22 percent Bernaldo soils, and 33 percent other soils.

Besner soils are on low mounds. Typically, the surface layer is strongly acid, grayish brown fine sandy loam about 4 inches thick. The next layer to a depth of 22 inches is pale brown fine sandy loam. The subsoil is very strongly acid, brownish fine sandy loam to a depth of 37 inches. To a depth of 70 inches it is strongly acid, sandy clay loam that is strong brown in the upper part and yellowish brown in the lower part.

Bernaldo soils are on low, intermound areas. Typically, the surface layer is strongly acid or very strongly acid loam about 8 inches thick. It is dark grayish brown in the upper part and yellowish brown in the lower part. The subsoil to a depth of 75 inches is very strongly acid or strongly acid sandy clay loam. It is yellowish brown in the upper part, strong brown in the middle part, and brownish yellow in the lower part.

Other soils in this map unit are Attoyac, Evadale, Mollville, Waller, Bienville, Gallime, Alaga, and Spurger soils. Evadale, Mollville, and Waller soils are in concave depressions and small drains. Attoyac, Bienville, Alaga, and Spurger soils are on smoother and slightly higher positions than Bernaldo and Besner soils. Gallime soils are on ridges and mounds.

Areas of these soils are used for timber production, woodland grazing, and pasture. The potential for pine trees and pasture is very high. The potential for urban and recreational uses is high.

loamy and clayey soils of the uplands

This group of soils makes up about 6 percent of the survey area. The major soils are Woodville and Redco soils. These gently sloping soils of the uplands have loamy to clayey surface layers and clayey underlying layers. They are somewhat poorly drained and moderately well drained. Permeability is very slow.

Most areas of these soils are in woodland. The potential for the production of pine trees is high. The principal trees are shortleaf pine and loblolly pine. Some areas are used as pasture. Improved pasture is bahiagrass or bermudagrass. Some pastures are planted to spring legumes, such as crimson clover, arrowleaf clover, white clover, or vetch. The soils have low potential for urban uses because of wetness and shrinking and swelling with changes in moisture content.

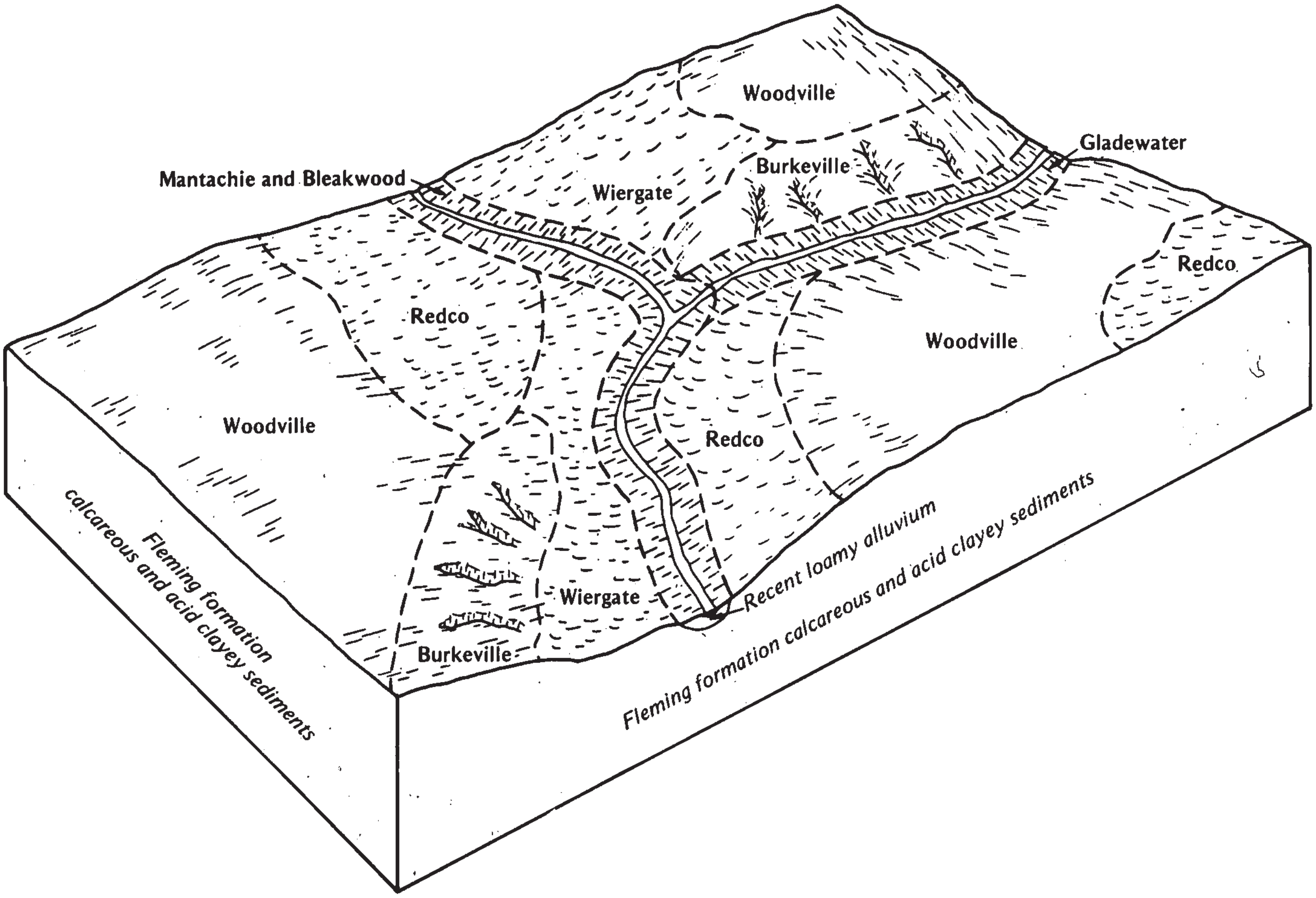


Figure 6.—Pattern of soils and underlying material in the Woodville-Redco general soil map unit.

11. Woodville-Redco

Gently undulating, deep, loamy and clayey, somewhat poorly drained and poorly drained soils

This map unit makes up about 6 percent of the survey area. It is 33 percent Woodville soils, 20 percent Redco soils, and 47 percent other soils (fig. 6).

Woodville soils are on ridges and broad interstream divides. Typically, the surface layer is strongly acid fine sandy loam about 9 inches thick. It is dark grayish brown in the upper part and pale brown in the lower part. The subsoil extends to a depth of 65 inches or more. It is very strongly acid, dark red clay to a depth of 20 inches; very strongly acid, mottled red and gray clay to a depth of 45 inches; and very strongly acid, light gray clay to a depth of 65 inches.

Redco soils are mostly on the slightly concave, lower side slopes and on the less sloping parts of broad ridges. Typically, the surface layer is very strongly acid, dark brown clay about 5 inches thick. To a depth of 72 inches the soil is very strongly acid clay that is yellowish brown in the upper part, light brownish gray in the middle part, and gray in the lower part. Mottles of red, gray, brown, and yellow are throughout.

Other soils in this map unit are Wiergate, Burkeville, Newco, Gladewater, Mantachie, and Bleakwood soils. Wiergate soils are in positions similar to those of the Redco soils. Burkeville and Newco soils are on sides slopes and some ridge crests. Gladewater, Mantachie, and Bleakwood soils are on bottom lands.

Areas of this map unit are used mostly for timber production and woodland grazing. The potential for pine trees is high. The main limitation is the clayey subsoil.

The potential for pasture plants is high. The clayey subsoil is a limitation.

The potential for urban uses is low. Wetness and the shrinking and swelling of the soil with changes in moisture content are limitations. Low strength is a limitation for local roads and streets. The potential for recreational uses is low because of the clayey surface layer and very slow permeability.

broad land use considerations

The soils in Jasper and Newton Counties vary widely in their potential for major land uses. About 88 percent of the total area of the two counties is used for commercial timber production. The main trees grown are loblolly pine, slash pine, shortleaf pine, longleaf pine, and various kinds of hardwoods.

The productivity for pines and hardwoods is very high on soils in general soil map units 4, 5, 6, 7, 8, and 10. Productivity is high on the soils in map units 1, 9, and 11 and medium on the soils in map units 2 and 3. The use of forestry equipment is restricted on some soils, except during the drier season.

A small part of the survey area is used for pasture. The productivity for improved varieties of bermudagrass, bahiagrass, and legumes is very high on the soils in general soil map units 1, 4, 6, and 10 and high on the soils in map units 8, 9, and 11. Productivity is medium on the soils in map units 7 and low on the soils in map units 2, 3, and 5.

The potential for urban uses ranges from very high to very low, depending on the soil properties. Most of the soils in general soil map unit 9 have very high potential for urban uses, and the soils in map unit 10 have high potential. Soils on flood plains, such as those in general soil map units 7 and 8, are not suited to urban development because of flooding. The soils in map units 1, 2, 3, and 11 have medium to low potential because of excessive slope and the high shrink-swell potential of clayey soils, such as Corrigan, Kisatchie, Rayburn, Woodville, and Redco soils. Sites that are suitable for homes and small commercial buildings are generally available in these areas. The soils in map units 4, 5, and 6 have medium to low potential for urban uses because of wetness and low soil strength.

The potential for recreational uses ranges from low to high, depending on the anticipated uses of the soils. Most of the soils in general soil map units 9 and 10 have high potential for recreational development. The soils in map units 7 and 8 have low potential because of flooding. The soils in map units 1, 2, 3, 4, 5, 6, and 11 have medium to low potential because of slope, wetness, slow water movement through the soil. and clayey texture. Small areas that are suitable for recreational development may be available in map units that have low potential.

detailed soil map units

The map units on the detailed soil maps at the back of this survey represent the soils in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of a soil for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit, or soil, is given under "Use and management of the soils."

Each map unit on the detailed soil maps represents an area on the landscape and consists of one or more soils for which the unit is named.

A symbol identifying the soil precedes the map unit name in the soil descriptions. Each description includes general facts about the soil and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer or of the underlying material, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Evadale silt loam, 0 to 1 percent slopes, is one of several phases in the Evadale series.

Some map units are made up of two or more major soils. These map units are called soil complexes, soil associations, or undifferentiated groups.

A *soil complex* consists of two or more soils in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Bernaldo-Besner complex, gently undulating, is an example.

A *soil association* is made up of two or more geographically associated soils that are shown as one unit on the maps. Because of present or anticipated soil uses in the survey area, it was not considered practical or necessary to map the soils separately. The pattern and relative proportion of the soils are somewhat similar. Corrigan-Rayburn association, gently undulating, is an example.

An *undifferentiated group* is made up of two or more soils that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils in a mapped area are not uniform. An area can be made up of only one of the major soils, or it can be made up of all of them. In this survey area, most of the undifferentiated groups are named for only one soil series. The named soils have variable surface texture. Deweyville soils, frequently flooded, is an undifferentiated group in this survey area. The texture of the surface layer of Deweyville soils ranges from mucky silt loam to mucky silty clay loam.

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soil or soils. Such differences could significantly affect use and management of the soils in the map unit. The included soils are identified in each map unit description. Some small areas of strongly contrasting soils are identified by a special symbol on the soil maps.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils.

AtA—Attoyac fine sandy loam, 0 to 3 percent slopes. These deep, nearly level, loamy soils are on broad terraces of the major river systems. Slopes range from 0 to 3 percent. Soil areas are irregular in shape and range from 20 to 520 acres.

Typically, the surface layer is strongly acid, brownish fine sandy loam about 11 inches thick. The upper part of the subsoil to a depth of 20 inches is strongly acid, yellowish red sandy clay loam. The lower part of the subsoil to a depth of 72 inches is strongly acid, red sandy clay loam that grades to yellowish red sandy clay loam.

This Attoyac soil is well drained. Runoff is slow. Permeability is moderate, and the available water capacity is high. Water erosion is not a hazard, or it is a slight hazard.

Included with this soil in mapping are small areas of Bernaldo, Besner, and Mollville soils. Bernaldo soils are on landscape positions similar to those of Attoyac soils. Besner soils are on mounds. Mollville soils are in small depressions, mostly of less than two acres. A soil similar to the Attoyac soil but having a fine sandy loam subsoil is on low ridges. These included soils make up about 20 percent of any mapped area.

Areas of this Attoyac soil are used mainly as woodland and pasture. The potential productivity for pine and hardwood trees is very high. The dominant trees are loblolly pine, longleaf pine, red oak, and sweetgum. Many areas are planted to slash pine.

This soil has low potential for the production of understory plants that can be grazed by livestock. Plant competition and rapid changes in the overstory reduce forage plant production. Major understory plants are pinehill bluestem, splitbeard bluestem, longleaf uniola, Carolina jessamine, yaupon, greenbrier, and waxmyrtle.

The potential for pasture and hayland plants is very high. Proper fertilization, liming, and grazing management are necessary for best production of improved bermudagrass, bahiagrass, crimson clover, and arrowleaf clover.

The potential is high for most urban uses of this soil. Low strength is a limitation for local roads and streets.

This Attoyac soil is in capability subclass IIe and woodland ordination group 1o7.

BaB—Bernaldo-Besner complex, gently undulating. These deep, loamy soils are on terraces of the major river systems. Slopes range from 0 to 3 percent. Soil areas are oblong to irregular in shape and range from 40 to about 1,100 acres.

This association is 40 to 45 percent Bernaldo soils, 20 to 35 percent Besner soils, and 20 to 30 percent other soils. These percentages were determined by taking samples from random transects made across mapped areas.

Bernaldo soils are in the intermound areas. Besner soils are on oval mounds that are 10 to 26 inches high and 50 to 200 feet across. Other soils in this complex are Attoyac, Spurger, Bienville, Alaga, Mollville, and Gallime soils. Attoyac soils are on similar landforms as Bernaldo soils. Gallime soils are on similar landforms as Besner soils, but the mounds are long and narrow. Bienville and Alaga soils are on low ridges Mollville soils are in long, narrow depressions.

Typically, Bernaldo soils have a surface layer of strongly acid loam about 8 inches thick. The surface layer is dark grayish brown in the upper part and yellowish brown loam in the lower part. The subsoil to a depth of 75 inches is strongly acid to very strongly acid sandy clay loam that is yellowish brown and strong brown in the upper part and brownish yellow with pockets and streaks of gray loam in the lower part.

Typically, Besner soils have a surface layer of grayish brown, strongly acid fine sandy loam about 4 inches thick. The next layer to a depth of 22 inches is pale brown strongly acid fine sandy loam. The subsoil extends to a depth of 70 inches or more. It is very strongly acid, pale brown fine sandy loam to a depth of 34 inches; strongly acid, brown fine sandy loam to a depth of 37 inches; strongly acid, strong brown sandy clay loam to a depth of 48 inches; and strongly acid, yellowish brown sandy clay loam to a depth of 70 inches.

These soils are well drained. Permeability is moderate, and runoff is slow or medium. The available water capacity is high in Bernaldo soils and medium in Besner soils. These soils have a water table at a depth of 4 to 6 feet during the winter and early in spring. The erosion hazard is slight, or there is no erosion hazard.

Areas of these soils are used mainly as woodland and pasture. The potential productivity for pine and hardwood trees is very high. Dominant trees are loblolly pine, longleaf pine, sweetgum, and southern red oak. Many areas are planted to slash pine.

These soils have low potential for the production of understory plants that can be grazed by livestock and game animals. Plant competition and rapid changes in the overstory reduce the production of forage plants. Major understory plants typically found on these soils are pinehill bluestem, splitbeard bluestem, American beautyberry, longleaf uniola, Carolina jessamine, yaupon, greenbrier, and waxmyrtle.

The potential for pasture and hayland plants is very high. Proper fertilization, liming, and grazing management are necessary for best production of improved bermudagrass and bahiagrass, crimson clover, and arrowleaf clover.

The potential for most urban uses of these soils is medium. The main limitations are wetness and the shrinkage and swelling of the soil with changes in moisture content. Low strength is a limitation for local roads and streets.

These soils are in capability subclass IIe and woodland ordination group 1o7.

BeB—Besner-Mollville complex, gently undulating. These deep, loamy soils are on terraces on broad areas above flood plains of the major rivers. Slopes range from 0 to 3 percent. Soil areas are oblong and range from 60 to 1,480 acres.

This complex is 50 to 60 percent Besner soils, 30 to 35 percent Mollville soils, and 10 to 15 percent other soils. These percentages were determined by taking samples from random transects made across mapped areas.

The Besner soils are on low ridges that are mostly 3 to 6 feet high, 50 to 200 feet wide, and 500 feet to several thousand feet long. Mollville soils are in low areas 40 to 150 feet across. Other soils in this complex are small areas of Bernaldo and Spurger soils on low ridges, Alaga and Bienville soils on higher ridges, and Mantachie soils in drainageways.

Typically, the surface layer of Besner soils is grayish brown, strongly acid fine sandy loam about 4 inches thick. The next layer to a depth of 22 inches is light yellowish brown, strongly acid fine sandy loam. The upper part of the subsoil to a depth of 28 inches is very strongly acid, reddish brown fine sandy loam that has pockets and streaks of light yellowish brown fine sandy loam. The lower part of the subsoil to a depth of 65 inches is strongly acid, yellowish brown sandy clay loam.

Typically, the surface layer of Mollville soils is very strongly acid, dark grayish brown silt loam about 4 inches thick. The next layer to a depth of 12 inches is light gray very fine sandy loam. The upper part of the subsoil to a depth of 26 inches is very strongly acid, grayish brown clay loam that has about 20 percent tongues and streaks of light gray very fine sandy loam. The middle part of the subsoil to a depth of 59 inches is strongly acid, grayish brown clay loam. The lower part of the subsoil to a depth of 76 inches is medium acid, light brownish gray fine sandy loam.

Besner soils are well drained; runoff is slow; and permeability is moderate. Mollville soils are poorly drained; runoff is very slow, and permeability is slow. These soils have medium available water capacity. The Besner soils have a high water table at a depth of 4 to 6 feet during the winter and spring. The Mollville soils are ponded up to 0.5 foot during this time and have a water table above a depth of 1 foot most of the year.

Areas of these soils are used mainly as woodland. The potential productivity for pine and hardwood trees is very high for Besner soils and medium for Mollville soils. Dominant trees are loblolly pine, shortleaf pine, red oak, and sweetgum. Many clear-cut areas are planted to slash pine. The main limitation is the restricted use of harvesting equipment on Mollville soils caused by wetness.

The potential for the production of understory plants that can be grazed by livestock and game animals is low for Besner soils and medium for Mollville soils. Plant competition, wetness, and rapid changes in the overstory reduce the production of forage plants. Major understory plants in a well managed woodland on the Besner soils are pinehill bluestem, splitbeard bluestem, American beautyberry, longleaf uniola, Carolina jessamine, yaupon, greenbrier, and waxmyrtle. Major understory plants in a well managed woodland on the Mollville soils are longleaf uniola, Carolina jessamine, pinehill bluestem, low panicum, waxmyrtle, blackgum, and sedges.

Some areas of these soils are used as pasture. The potential for pasture and hayland plants is very high on Besner soils and medium on Mollville soils. Proper fertilization, liming, and grazing management are necessary for best production of improved bahiagrass and bermudagrass, white clover, and singletary peas. The main limitation is wetness of the Mollville soils.

The potential is high for most urban uses of the Besner soils. Low strength is a limitation for local roads and streets. The potential is very low for most urban uses of Mollville soils. The main limitations are wetness and flooding.

The Besner soils are in capability subclass IIe and woodland ordination group 1o7. The Mollville soils are in capability subclass IVw and woodland ordination group 3w9.

BIB—Bienville-Alaga association, gently undulating. These deep, sandy soils are on broad terraces of the major river systems. Slopes range from 1 to 5 percent, but most are less than 2 percent. Soil areas are oblong or long and narrow and lie parallel to areas on bottom lands. Soil areas range from 40 to 1,800 acres.

This association is 30 to 60 percent Bienville soils, 30 to 40 percent Alaga soils, and 10 to 30 percent other soils. These percentages were determined by taking samples from random transects made across mapped areas.

Bienville soils are mostly on broad, plane areas. Alaga soils are mostly on low, long, narrow ridges. Other soils in this association are small areas of Besner and Gallime soils on slightly higher areas; Mollville soils in long, narrow sloughs; and Mantachie and Iuka soils in drainageways.

Typically, the surface layer of Bienville soils is medium acid, brown loamy fine sand about 6 inches thick. The next layer to a depth of 20 inches is strongly acid, brown loamy fine sand. The subsoil is very strongly acid, strong brown loamy fine sand that has spots and streaks of clean sand grains to a depth of 70 inches, and very strongly acid, pale brown sand to a depth of 80 inches.

Typically, the surface layer of Alaga soils is strongly acid, dark grayish brown loamy sand about 5 inches thick. To a depth of 65 inches the soil is strongly acid loamy sand that is yellowish brown in the upper part and brownish yellow in the lower part. To a depth of 80 inches the soil is strongly acid, light gray and light yellowish brown sand.

These soils are somewhat excessively drained. Runoff is slow. Permeability of Bienville soils is moderately rapid, and permeability of Alaga soils is rapid. The available water capacity is medium for Bienville soils and low for Alaga soils. Some areas of these soils are flooded about once in 50 years for a brief period.

Areas of these soils are used as woodland and pasture. The potential productivity for pine trees is high on the Bienville soils and medium on the Alaga soils. Dominant trees are loblolly, longleaf, and shortleaf pines. Many areas are planted to slash pine. Pine seedling mortality caused by droughtiness is a limitation.

These soils have medium potential for the production of understory plants that can be grazed by livestock and game animals. Low natural fertility and droughtiness reduce the production of forage plants. Major understory plants in a well managed woodland are pinehill bluestem, pineywoods dropseed, splitbeard bluestem, brackenferns, threeawns, American beautyberry, and hawthorn.

The potential for pasture and hayland plants is very high on Bienville soils and medium on Alaga soils. The main limitation is the droughty, sandy surface layer. Proper fertilization, liming, and grazing management are necessary for best production of improved bermudagrass and bahiagrass, and vetch.

The potential is high for urban uses of these soils.

These soils are in capability subclass IIIs. The Bienville soils are in woodland ordination group 2s2, and the Alaga soils are in woodland ordination group 3s2.

BOE—Bonwier-Stringtown association, hilly. These deep, loamy soils are on uplands on ridgetops and side slopes. Slopes range from 5 to 20 percent. Soil areas are mostly irregular in shape, but some are long and narrow. Soil areas range from 40 to 325 acres.

This association is 60 to 75 percent Bonwier soils, 20 to 30 percent Stringtown soils, and 5 to 10 percent other soils. These percentages were determined by taking samples from random transects made across mapped areas.

Bonwier soils are on the crests of ridges. Stringtown soils are on convex surfaces and side slopes of ridges. Other soils in this association are Doucette and Shankler soils on concave, middle and lower slopes and Urland soils on ridgetops and upper side slopes.

Typically, the surface layer of Bonwier soils is strongly acid fine sandy loam about 9 inches thick. It is dark grayish brown in the upper part and brown in the lower part. The subsoil to a depth of 33 inches is very strongly acid, red clay that is mottled with light gray and dark yellowish brown in the lower part. The underlying material to a depth of about 60 inches is very strongly acid, gray, red, and yellow stratified clay, clay shale, and sandstone.

Typically, the surface layer of Stringtown soils is very strongly acid fine sandy loam about 10 inches thick. It is dark grayish brown in the upper part and yellowish brown in the lower part. The subsoil to a depth of 45 inches is very strongly acid, strong brown sandy clay loam that has mottles of gray, red, and yellow. It is about 2 percent plinthite in the lower part. To a depth of 60 inches the soil is extremely acid, mottled red, yellow, and gray, stratified shale and soft sandstone.

These soils are well drained. Permeability is moderate, and runoff is medium or rapid. Bonwier soils have low available water capacity, and Stringtown soils have high available water capacity.

Areas of these soils are used mainly as woodland. The potential productivity is low for pine trees on Bonwier soils and medium for pine and hardwood trees on Stringtown soils. Dominant trees are loblolly pine, shortleaf pine, and mixed hardwoods. The main limitation is the clayey subsoil in the Bonwier soils. These soils have an erosion hazard if the vegetation is removed.

The potential for the production of understory plants that can be grazed by livestock and game animals is very high for Bonwier soils and medium for Stringtown soils. Plant competition reduces the production of forage plants on Stringtown soils. Major understory plants in a well managed woodland are pinehill bluestem, sedges, slender bluestem, low panicum, Carolina jessamine, brownseed paspalum, pineywoods dropseed, waxmyrtle, blackberry, and American beautyberry.

Some areas of these soils are used as pasture. The potential for pasture and hayland plants is medium. The main limitation is the clayey subsoil in the Bonwier soils. Proper fertilization, liming, and grazing management are necessary for best production of improved bermudagrass and bahiagrass, crimson clover, and arrowleaf clover.

The potential is low for urban uses of these soils. The main limitations are slope and the shrinking and swelling of the soil with changes in moisture content. Low strength is a limitation for local roads and streets.

These soils are in capability subclass VIe. The Bonwier soils are in woodland ordination group 4c2, and the Stringtown soils are in woodland ordination group 3o7.

BrD—Browndell-Rock outcrop complex, sloping. These shallow, loamy soils and Rock outcrop are on upland ridges and side slopes. Slopes range from 2 to 12 percent. Soil areas are irregular in shape and range from 18 to 200 acres.

This complex is 55 to 75 percent Browndell soils, 10 to 20 percent Rock outcrop, and 15 to 25 percent other soils. These percentages were determined by taking samples from random transects made across mapped areas.

Browndell soils are mostly on the side slopes of ridges. Rock outcrop is mostly on the ridgetops and convex side slopes. Other soils in this complex are Corrigan, Kisatchie and Tahoula soils, mostly on concave, middle and lower slopes.

Typically, the surface layer of Browndell soils is slightly acid, dark grayish brown loam about 4 inches thick. The subsoil to a depth of 15 inches is strongly acid, grayish brown clay. The underlying material to a depth of 30 inches is strongly acid, pale olive, weakly consolidated, tuffaceous sandstone.

The Rock outcrop in this complex is weakly consolidated, tuffaceous sandstone.

Browndell soils are somewhat poorly drained. Permeability is very slow, and runoff is rapid. The available water capacity is very low.

Areas of these soils are used mainly as woodland. The potential productivity for pine trees is very low. Dominant trees are loblolly, shortleaf, and longleaf pines. The main limitation is the shallow rooting depth.

These soils have very low potential for the production of understory plants that can be grazed by livestock and game animals. Droughtiness and shallow rooting depth reduce the production of forage plants. Major understory plants are threeawns, yaupon, pinehill bluestem, and hawthorn.

Some areas of these soils are used as pasture. The potential for pasture and hayland plants is low. The main limitations are the shallow rooting depth and clayey subsoil. Proper fertilization, liming, and grazing management are necessary for best production of improved bermudagrass, crimson clover, and arrowleaf clover.

The potential is low for urban uses of these soils. The main limitations are the Rock outcrop and the shrinking and swelling of the soil with changes in moisture content. Low soil strength is a limitation for local roads and streets.

The Browndell soils in this complex are in capability subclass VIe and woodland ordination group 5d3.

BuD—Burkeville clay, 3 to 12 percent slopes. These deep, gently sloping to strongly sloping, clayey soils are on ridges and side slopes on uplands. Most areas have been eroded and have V-shaped gullies 1/2 foot to 8 feet deep. Soil areas are irregular in shape and range from 20 to 240 acres.

Typically, the surface layer is moderately alkaline, dark gray clay about 5 inches thick. The next layer to a depth of 18 inches is moderately alkaline, light olive gray clay that is mottled with brown and yellow. The underlying layer to a depth of 65 inches is moderately alkaline, light gray clay that is mottled with brown and yellow. This soil is calcareous throughout and has slickensides in the lower part.

This Burkeville soil is somewhat poorly drained. Runoff is medium. Permeability is very slow. The available water capacity is high. The soil is saturated to a depth of 2 feet for a few months during the winter and early in spring.

Included with this soil in mapping are areas of Wiergate, Woodville, and Redco soils. Wiergate and Redco soils are on landscape positions similar to the Burkeville soils. Woodville soils are on the higher ridges and side slopes. These included soils make up 10 to 15 percent of any mapped area.

Areas of this Burkeville soil are used mainly as pasture. Some areas are in woodland. The potential productivity for pine trees is very low. Dominant trees are loblolly pine and shortleaf pine. The main limitations for growing pines are the clayey texture and droughtiness, which causes a high rate of pine seedling mortality. Seasonal wetness hampers harvesting operations.

This soil has very low potential for the production of understory plants that can be grazed by livestock and game animals. Droughtiness and the dense clayey texture reduce the production of forage plants. Major understory plants are pinehill bluestem, hawthorn, yaupon, and threeawns.

The potential for pasture and hayland plants is medium. The main limitation is the dense, clayey soil layers. Proper fertilization and grazing management are necessary for best production of improved bermudagrass, arrowleaf clover, white clover, and vetch.

The potential is low for urban uses of this soil. The main limitations are wetness and the shrinking and swelling of the soil with changes in moisture content. Low soil strength is a limitation for local roads and streets.

This Burkeville soil is in capability subclass VIe and woodland ordination group 5c0.

CRB—Corrigan-Rayburn association, gently undulating. These moderately deep and deep, loamy soils are on uplands on low ridges and their side slopes. Slopes range from 1 to 5 percent. Soil areas are oblong to irregular in shape and range from 34 to 780 acres.

This association is 55 to 70 percent Corrigan soils, 15 to 25 percent Rayburn soils, and 15 to 20 percent other soils. These percentages were determined by taking samples from random transects made across mapped areas.

Corrigan soils are on smooth ridges and concave side slopes. Rayburn soils are on the convex crests and upper side slopes of ridges. Other soils in this association are Browndell soils on small knolls and ridges, Letney soils on tops of some ridges, Tahoula soils on side slopes, and Nikful soils on concave lower slopes.

Typically, the surface layer of Corrigan soils is very strongly acid fine sandy loam about 8 inches thick. It is very dark grayish brown in the upper part and grayish brown in the lower part. The subsoil to a depth of 36 inches is extremely acid clay that is dark grayish brown in the upper part and grades to light brownish gray and pale olive in the lower part. The underlying material to a depth of 60 inches is extremely acid, light olive gray, weakly consolidated volcanic tuff.

Typically, the surface layer of Rayburn soils is very strongly acid fine sandy loam about 7 inches thick. It is dark grayish brown in the upper part and grayish brown in the lower part. The upper part of the subsoil to a depth of 19 inches is very strongly acid, reddish brown clay. The lower part of the subsoil to a depth of 55 inches is very strongly acid, grayish brown clay. The underlying material to a depth of 70 inches is extremely acid, grayish brown, tuffaceous siltstone.

Corrigan soils are somewhat poorly drained, and Rayburn soils are moderately well drained. Runoff is slow to rapid, and permeability is very slow. The available water capacity is low for Corrigan soils and medium for Rayburn soils. The Corrigan soils have a perched water table above a depth of 3 feet during the winter and spring. The Rayburn soils have a perched water table at a depth of 2.5 to 4.5 feet during winter.

Areas of these soils are used mainly as woodland. The potential productivity for pine and hardwood trees is medium on the Corrigan soils and high on the Rayburn soils. Dominant trees are loblolly pine, shortleaf pine, longleaf pine, red oak, and sweetgum. Some clear-cut areas are planted to slash pine. The main limitation is slow growth and high pine seedling mortality caused by the clayey subsoil. The use of equipment is limited because of seasonal wetness and low soil strength. Harvesting operations should be done during dry periods.

These soils have very high potential for the production of understory plants that can be grazed by livestock and game animals. Major understory plants are pinehill bluestem, waxmyrtle, splitbeard bluestem, Carolina jessamine, longleaf uniola, and sedges.

Some areas of these soils are used as pasture. The potential for pasture and hayland plants is low. The main limitation is the dense, clayey subsoil. Proper fertilization, liming, and grazing management are necessary for best production of improved bermudagrass and bahiagrass, crimson clover, arrowleaf clover, and vetch.

The potential is low for urban uses of these soils. The main limitations are wetness and the shrinking and swelling of the soil with changes in moisture content. Low strength is a limitation for local roads and streets.

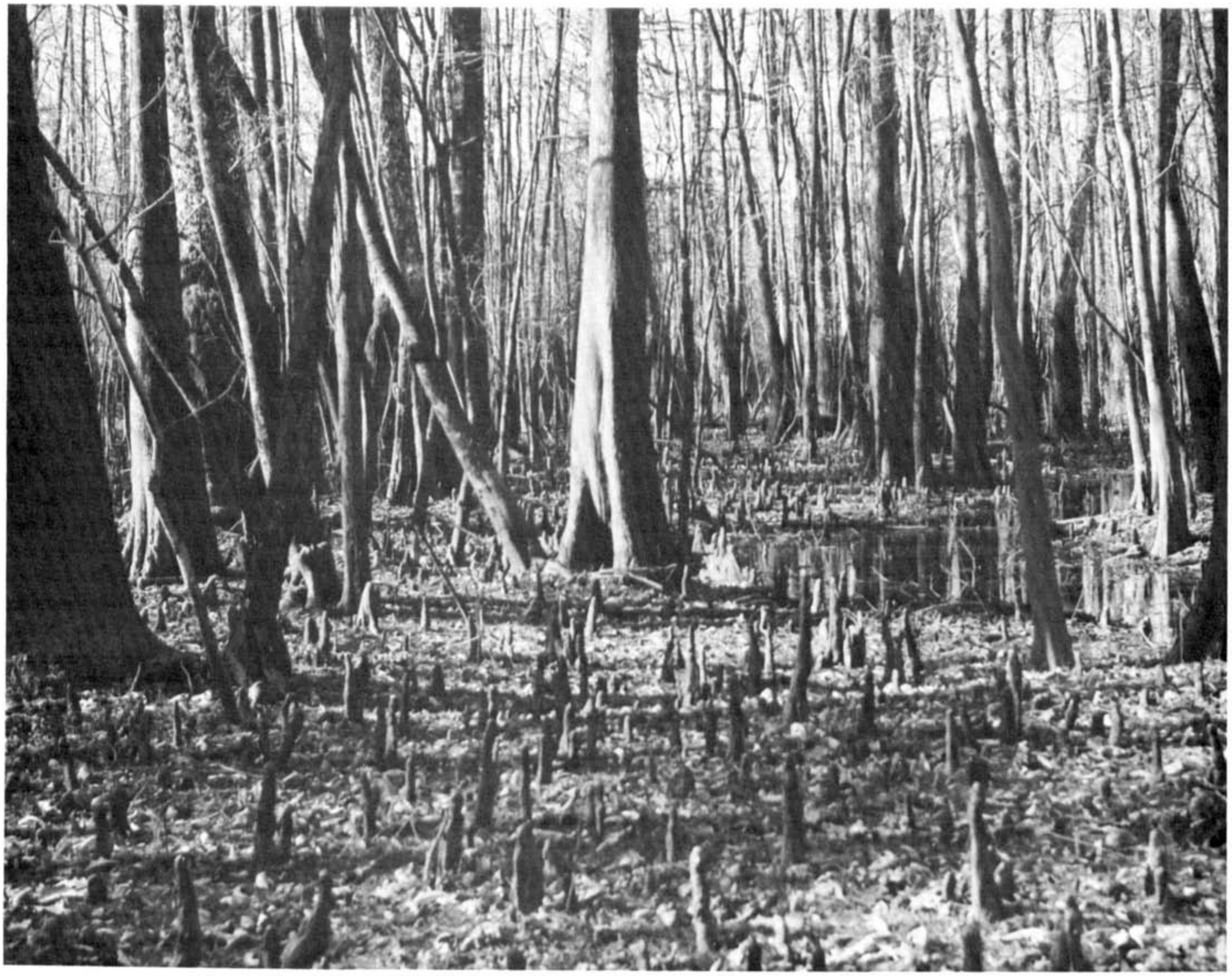


Figure 7.—An area of Deweyville soils, frequently flooded.

These soils are in capability subclass IVe. The Corrigan soils are in woodland ordination group 3c8, and the Rayburn soils are in woodland ordination group 2c8.

De—Deweyville soils, frequently flooded. These deep, nearly level, loamy, organic soils are on bottom lands (fig. 7). These soils are on flood plains adjacent to streams that flood frequently. Slopes are less than 1 percent. Soil areas are oval or oblong and range from 50 to 620 acres. The texture of the surface layer ranges from mucky silt loam to mucky silty clay loam. These soils do not occur in a regular pattern within a mapped area.

Typically, the surface layer is extremely acid, very dark grayish brown mucky silt loam about 4 inches thick. The underlying layer to a depth of 70 inches is extremely acid, dark brown hemic material that is partially decomposed tree roots and logs.

Deweyville soils are very poorly drained. Runoff is very slow, and permeability is moderately rapid. The available water capacity is high. Deweyville soils are saturated by fresh water at or near the surface or are ponded throughout the year.

Included with these soils in mapping are areas of Urbo, Mantachie, Bleakwood, and Iuka soils. These mineral soils are slightly higher on the flood plain than Deweyville soils. The included soils make up 15 to 20 percent of any mapped areas.

Areas of the Deweyville soils are used mainly as wildlife habitat and woodland. The potential for hardwood trees is low. These soils are not suited to pine trees. Dominant trees are water tupelo, baldcypress, swamp tupelo, and blackgum. The main limitation is the high seedling mortality rate caused by wetness. The use of timber harvesting equipment is limited because of wetness.

These soils have very low potential for the production of understory plants that can be grazed by livestock and game animals. Wetness and a thick canopy of hardwoods reduce forage plant production. Major understory plants are sedges, smartweed, rushes, and swamp tupelo.

These soils are not suited to pasture and hayland plants. The potential is very low because of wetness.

The potential is very low for urban uses of these soils because of flooding. Low strength is a limitation for local roads and streets.

These Deweyville soils are in capability subclass VIIw and woodland ordination group 4w6.

DUB—Doucette-Boykin association, undulating. These deep, sandy soils are on broad ridgetops and side slopes above drainageways on uplands. Slopes range from 1 to 8 percent. Soil areas are irregular in shape and range from 40 to 800 acres.

This association is 30 to 55 percent Doucette soils, 15 to 40 percent Boykin soils, and 20 to 30 percent other soils. These percentages were determined by taking samples from random transects made across mapped areas.

Doucette soils are on broad ridges and their middle and upper side slopes. Boykin soils are mostly on middle and lower side slopes. Other soils in this association are small areas of Pinetucky soils on ridges and upper side slopes, Shankler soils on lower side slopes, and a soil that is a loamy sand to a depth of more than 80 inches on lower side slopes in some areas. A soil similar to Boykin soils that has a gray subsoil is on lower side slopes and in some drainageways.

Typically, the surface layer of Doucette soils is medium acid loamy fine sand about 12 inches thick. It is dark grayish brown in the upper part and brown in the lower part. The next layer to a depth of 24 inches is strongly acid, light yellowish brown loamy fine sand. The subsoil to a depth of 80 inches is very strongly acid sandy clay loam that is about 6 percent plinthite in the lower part. The subsoil is strong brown in the upper part, brownish yellow in the middle part, and reddish yellow in the lower part. Yellow, red, and gray mottles are throughout the subsoil.

Typically, the surface layer of Boykin soils is medium acid, brown loamy fine sand 8 inches thick. The next layer to a depth of 24 inches is medium acid, yellowish brown loamy fine sand. The subsoil extends to a depth of 80 inches or more. It is medium acid, yellowish red fine sandy loam to a depth of 27 inches; strongly acid and very strongly acid, red and yellowish red sandy clay loam to a depth of 72 inches; and very strongly acid, reddish yellow sandy clay loam that has mottles of light gray to a depth of 80 inches.

These Doucette and Boykin soils are well drained. Runoff is slow. Permeability is moderate. The available water capacity is medium in the Doucette soils and low in the Boykin soils.

Areas of this association are used mainly as woodland and pasture. The potential productivity for pine trees is high. The dominant trees are loblolly, shortleaf, and longleaf pines. Some clear-cut areas are planted to slash pine. The pine seedling mortality rate is moderate because of the droughtiness of the surface layer.

These soils have medium potential for the production of understory plants that can be grazed by livestock and game animals. Low natural fertility and droughtiness reduce the production of forage plants. Major understory plants are pinehill bluestem, pineywoods dropseed, splitbeard bluestem, brackenferns, sedges, American beautyberry, and tickclover.

These soils have very high potential for pasture and hayland plants. Proper fertilization, liming, and grazing management are necessary for best production of improved bermudagrass and bahiagrass, crimson clover, arrowleaf clover, and vetch.

The potential is high for most urban uses of these soils. The main limitations are slope in places and sandy texture.

The Doucette and Boykin soils are in capability subclass IIIe and woodland ordination group 2s2.

EaA—Evadale silt loam, 0 to 1 percent slopes. These deep, nearly level, loamy soils are on uplands and terraces in low areas and on broad areas at heads of drainageways. Some areas are in old, meandering, shallow sloughs. Soil areas are irregular in shape and range from 40 to 1,100 acres.

Typically, the surface layer is very strongly acid, gray silt loam about 11 inches thick. It is dark grayish brown in the upper part and grayish brown in the lower part. The upper part of the subsoil to a depth of 17 inches is medium acid, dark gray silty clay loam. Spots and streaks, 2 to 3 inches wide, of grayish, silt loam surface material extend into this layer. The lower part of the subsoil to a depth of 65 inches is medium acid, gray clay that has spots and streaks of silt loam and very fine sandy loam. It has mottles of yellowish red.

This Evadale soil is poorly drained. Runoff is slow. Permeability is very slow. The available water capacity is high. Most areas have a perched water table above a depth of 1.5 feet for several months, mostly in winter and spring.

Included with this soil in mapping are areas of Waller, Gist, Vidrine, and Besner soils. Waller soils are on similar landscape positions as the Evadale soil. Vidrine soils are on low mounds. Gist and Besner soils are on high mounds. These included soils make up 15 to 20 percent of any mapped area.

Areas of this Evadale soil are used mostly as woodland. The potential productivity for pine and hardwood trees is very high. Dominant trees are loblolly pine and water oak. Many areas are planted to slash pine. The use of harvesting equipment on these soils is restricted because of wetness.

This soil has medium potential for the production of understory plants that can be grazed by livestock and game animals. Wetness and an increase of the overstory canopy reduce forage plant production. Major understory plants are pinehill bluestem, longleaf uniola, sedges, greenbrier, waxmyrtle, Carolina jessamine, spreading panicum, and low panicum.

The potential for pasture and hayland plants is low. The main limitation is wetness. Proper fertilization, liming, and grazing management are necessary for best production of improved bahiagrass and bermudagrass, white clover, and singletary peas.

The potential for urban uses of this soil is low because of wetness. Low strength is a limitation for local roads and streets.

This Evadale soil is in capability subclass IIIw and woodland ordination group 1w9.

EdA—Evadale silty clay loam, ponded. These deep, nearly level, loamy soils are on broad areas that are covered with water mostly during winter and spring and other periods of high rainfall. Slopes are less than 1 percent. Soil areas are oblong to narrow and long and range from 50 to 560 acres.

Typically, the surface layer is strongly acid silty clay loam about 26 inches thick that is dark gray in the upper part and grayish brown in the lower part. The subsoil to a depth of 55 inches is strongly acid, light grayish silty clay loam that grades to silty clay in the lower part. The lower layer to a depth of 65 inches is strongly acid, light gray clay.

This Evadale soil is poorly drained. Runoff is slow. Permeability is very slow. The available water capacity is high. Most areas are ponded for eight to twelve months of the year, generally from December to August.

Included with this soil in mapping are areas of Waller and Gist soils. Waller soils are on similar landscape positions as the Evadale soil. Gist soils are on mounds, mostly along the edges of a mapped area. These included soils make up as much as 10 percent of any mapped area.

Areas of these soils are used mostly as wildlife habitat and woodland. The potential productivity for hardwood trees is very low. Dominant trees are Drummond red maple and green ash. The main limitation is excessive wetness, which affects the use of harvesting equipment.

This soil has very high potential for the production of understory plants that can be grazed by livestock and game animals. Major understory plants are low panicum, Florida paspalum, switchgrass, sedges, and Carolina jointtail.

The potential for pasture and hayland plants is very low. The main limitation is wetness. Drainage, proper fertilization, liming, and grazing management are necessary for best production of bahiagrass.

The potential for urban uses of this soil is very low because of wetness. Low strength is a limitation for local roads and streets.

This Evadale soil is in capability subclass Vw and woodland ordination group 5w0.

EgB—Evadale-Gist complex, gently undulating. These deep, loamy soils are on broad, mounded areas on uplands. Slopes range from 0 to 3 percent. Soil areas are irregular in shape and range from 100 to 3,000 acres.

This complex is 50 to 60 percent Evadale soils, 30 to 35 percent Gist soils, and 5 to 15 percent other soils. These percentages were determined by taking samples from random transects made across mapped areas of the complex.

Evadale soils are on the low, intermound areas. Gist soils are on round to oblong mounds that are 15 to 40 inches high and 75 to 250 feet across. Other soils of the complex are Besner soils on slightly higher mounds than Gist soils, Vidrine soils on low mounds, and Waller soils on low areas similar to the position of Evadale soils.

Typically, the surface layer of the Evadale soils is very strongly acid silt loam about 10 inches thick. It is dark grayish brown in the upper part and grayish brown in the lower part. The subsoil extends to a depth of 70 inches or more. The upper part of the subsoil to a depth of 18 inches is very strongly acid, gray silty clay loam that has pockets and streaks of light brownish gray silt loam. The lower part of the subsoil is strongly acid, grayish clay that has pockets and streaks of grayish silt loam.

Typically, the surface layer of the Gist soils is strongly acid, dark grayish brown very fine sandy loam about 4 inches thick. The next layer to a depth of 16 inches is strongly acid, light yellowish brown very fine sandy loam. The subsoil extends to a depth of 70 inches or more. The upper part of the subsoil to a depth of 41 inches is strongly acid and very strongly acid, yellowish brown loam that has pockets and streaks of very pale brown very fine sandy loam. The lower part of the subsoil is very strongly acid, gray clay loam that grades to clay at a depth of about 50 inches. The subsoil has pockets and streaks of light gray very fine sandy loam.

Evadale soils are poorly drained, and Gist soils are moderately well drained. Permeability of these soils is very slow, and runoff is slow. The available water capacity is high. In most years, Evadale soils have a perched high water table above a depth of 1.5 feet during winter and spring. Gist soils have a perched high water table at a depth of 2 to 4 feet during winter and spring.

Areas of these soils are used mostly as woodland. The potential productivity for pine and hardwood trees is very high. The dominant trees are loblolly pine and water oak. Many areas are planted to slash pine. The use of harvesting equipment is restricted on Evadale soils because of wetness.

The potential for the production of understory plants that can be grazed by livestock and game animals is medium for Evadale soils and low for Gist soils. Wetness, an increased overstory canopy, and rapid changes in the overstory reduce the production of forage plants on these soils. The major understory plants in a well managed woodland on Evadale soils are pinehill bluestem, splitbeard bluestem, sedges, greenbrier, waxmyrtle, Carolina jessamine, spreading panicum, and low panicum. The major understory plants on Gist soils are pinehill bluestem, splitbeard bluestem, American beautyberry, longleaf uniola, Carolina jessamine, yaupon, greenbrier, and waxmyrtle.

The potential for pasture and hayland plants is low on the Evadale soils and very high on the Gist soils. The main limitation of Evadale soils is wetness. Proper fertilization, liming, and grazing management are necessary for best production of improved bahiagrass and bermudagrass, white clover, hop clover, and singletary peas.

The potential for urban uses is low for Evadale soils and medium for Gist soils. The main limitation is wetness. Low strength is a limitation for local roads and streets.

The Evadale soils in this complex are in capability subclass IIIw and woodland ordination group 1w9. The Gist soils are in capability subclass IIw and woodland ordination group 1o7.

EvA—Evadale-Vidrine complex, nearly level. These deep, loamy soils are on uplands on broad areas that have low mounds. Slopes range from 0 to 1 percent. Soil areas are irregular in shape and range from 80 to 1,680 acres.

This association is 45 to 65 percent Evadale soils, 30 to 40 percent Vidrine soils, and 5 to 15 percent other soils. These percentages were determined by taking samples from random transects made across mapped areas.

Evadale soils are on the low areas. Vidrine soils are on round to oblong mounds about 5 to 20 inches high. Other soils in this complex are small areas of Gist soils on the higher mounds that are generally 20 to 40 inches high and Waller soils on low areas similar to Evadale soils.

Typically, the surface layer of Evadale soils is very strongly acid loam about 11 inches thick. It is dark grayish brown in the upper part and grayish brown in the lower part. The upper part of the subsoil to a depth of 20 inches is very strongly acid, grayish brown clay loam that has pockets and streaks of light brownish gray loam and very fine sandy loam. The middle part of the subsoil to a depth of 42 inches is very strongly acid, light brownish gray clay that has pockets and streaks of light brownish gray loam and very fine sandy loam. The lower part of the subsoil to a depth of 65 inches is strongly acid, light brownish gray clay that grades to silty clay loam.

Typically, the surface layer of Vidrine soils is medium acid, very fine sandy loam about 6 inches thick. It is dark grayish brown in the upper part and light brownish gray in the lower part. The subsoil extends to a depth of 60 inches or more and is strongly acid throughout. It is pale brown very fine sandy loam to a depth of 18 inches; mottled gray, yellowish brown, and red clay loam that has pockets and streaks of white very fine sandy loam to a depth of 21 inches; gray clay that is mottled with red and brown to a depth of 44 inches; and gray clay loam that is mottled with red and brown to a depth of 60 inches.

Evadale soils are poorly drained; runoff is slow, and permeability is very slow. Vidrine soils are somewhat poorly drained; runoff is medium, and permeability is slow. These soils have high available water capacity. The Evadale soils have a perched water table above a depth of 1.5 feet during winter and spring in most years. The Vidrine soils have a perched water table at a depth of 1 foot to 2 feet during winter and spring in most years.

Areas of these soils are used mostly as woodland. The potential productivity for pine and hardwood trees is very high. Dominant trees are loblolly pine and water oak. Many areas are planted to slash pine. The main limitation is wetness. The use of harvesting equipment on these soils is restricted because of wetness.

These soils have medium potential for the production of understory plants that can be grazed by livestock and game animals. Wetness, plant competition, and an increased overstory canopy reduce the production of forage plants. Major understory plants are pinehill bluestem, splitbeard bluestem, sedges, greenbrier, yaupon, longleaf uniola, waxmyrtle, Carolina jessamine, spreading panicum, and low panicum.

The potential for pasture and hayland plants is low on Evadale soils and medium on Vidrine soils. The main limitation is wetness. Proper fertilization, liming, and grazing management are necessary for best production of improved bahiagrass and bermudagrass, white clover, and singletary peas.

The potential for urban uses of the soils is low. The main limitation is wetness. Low strength is a limitation for local roads and streets.

These soils are in capability subclass IIIw and woodland ordination group 1w9.

GAB—Gallime-Spurger association, gently undulating. These deep, loamy soils are on terraces on broad areas above flood plains of the major rivers. Slopes range from 0 to 3 percent. Soils areas are irregular and range from 60 to 500 acres.

This association is 55 to 60 percent Gallime soils, 25 to 35 percent Spurger soils, and 10 to 15 percent other soils. These percentages were determined by taking samples from random transects made across mapped areas.

Gallime soils are on long, low ridges that are 3 to 5 feet high, 70 to 250 feet wide, and several feet long. Spurger soils are on the concave, low areas that are 30 to 150 feet wide and several hundred to several thousand feet long. Other soils in this association are small areas of Besner and Attoyac soils on low ridges similar to the position of Gallime soils, Bienville soils on higher ridges, and Mollville soils in low areas.

Typically, the surface layer of Gallime soils is medium acid, dark brown fine sandy loam about 4 inches thick. The next layer to a depth of 26 inches is medium acid, light yellowish brown fine sandy loam. The upper part of the subsoil to a depth of 48 inches is strongly acid, yellowish red sandy clay loam. The lower part of the subsoil to a depth of 62 inches is very strongly acid, yellowish red loam that has pockets and streaks of reddish yellow fine sandy loam.

Typically, the surface layer of Spurger soils is strongly acid fine sandy loam about 13 inches thick. It is dark grayish brown in the upper part and light yellowish brown in the lower part. The upper part of the subsoil to a depth of 21 inches is strongly acid, reddish yellow clay loam. The lower part of the subsoil to a depth of 58 inches is strongly acid, mottled red, yellow, and gray clay. The underlying material to a depth of 72 inches is very strongly acid, yellowish brown fine sandy loam.

Gallime soils are well drained; runoff is medium, and permeability is moderate. Spurger soils are moderately well drained; runoff is slow, and permeability is slow. The available water capacity of these soils is high. The Gallime soils commonly have a high water table at a depth of 4 to 6 feet during the winter and spring. The Spurger soils have a perched water table at a depth of 2.5 to 3.5 feet in winter and spring.

Areas of these soils are used mainly as woodland. The potential production for pine and hardwood trees is very high. Dominant trees are loblolly pine, shortleaf pine, southern red oak, and sweetgum. Some clear-cut areas are planted to slash pine. The use of equipment is restricted on Spurger soils because of seasonal wetness. Harvesting operations are best done during dry periods.

The potential for the production of understory plants that can be grazed by livestock and game animals is low for Gallime soils and medium for Spurger soils. Plant competition, wetness, and rapid changes in the overstory reduce the production of forage plants. Major overstory plants are pinehill bluestem, splitbeard bluestem, American beautyberry, low panicum, Carolina jessamine, sedges, yaupon, greenbrier, waxmyrtle, and pineywoods dropseed.

Some areas of these soils are used as pasture. The potential for pasture and hayland plants is very high on Gallime soils and high on Spurger soils. The main limitation is the clayey subsoil of the Spurger soils. Proper fertilization, liming, and grazing management are necessary for best production of improved bahiagrass and bermudagrass, crimson clover, arrowleaf clover, and vetch.

The potential is medium for most urban uses of these soils. The main limitations for urban uses are wetness and the shrinking and swelling of the soil with changes in moisture content. Low strength is a limitation for local roads and streets.

The Gallime soils are in capability subclass IIe and woodland ordination group 1o7. The Spurger soils are in capability subclass IIIe and woodland ordination group 1w2.

Gw—Gladewater soils, frequently flooded. These deep, nearly level, loamy soils are on bottom lands along large streams. Areas of these soils are flooded at least once in two years. Slopes range from 0 to 2 percent. Soil areas are generally long and narrow and range from 42 to 700 acres. The texture of the surface layer of these soils is variable, ranging from clay to clay loam. The soils do not occur in a regular pattern within a mapped area.

Typically, the surface layer is medium acid, dark gray clay loam about 4 inches thick. To a depth of 65 inches the soil is medium acid, grayish clay that has mottles in shades of brown and gray.

Gladewater soils are poorly drained. Runoff is very slow, and permeability is very slow. The available water capacity is high. These soils have a high water table above a depth of 3.5 feet during the winter and spring in most years.

Included with these soils in mapping are Urbo, Mantachie, and Bleakwood soils. Urbo soils are on similar landscape positions as Gladewater soils. Mantachie and Bleakwood soils are on slightly higher lying areas. These included soils make up about 15 percent of any mapped area.

Most areas of these soils are used as woodland. The potential productivity for hardwood trees is high. Dominant trees are mixed hardwoods. The main limitations are the clayey soil layers and wetness. The use of harvesting equipment is restricted on these soils because of wetness and flooding.

These soils have very low potential for the production of understory plants that can be grazed by livestock and game animals. Wetness and a thick canopy of hardwoods reduce forage plant production. Major understory plants are low panicum, pinehill bluestem, sedges, and spreading panicum.

Some areas of these soils are used as pasture. The potential for pasture and hayland plants is medium. The main limitation is the dense clayey subsoil. Proper fertilization, liming, and grazing management are necessary for best production of improved bermudagrass and bahiagrass, white clover, and singletary peas.

The soils are not suited to urban uses. Flooding and shrinking and swelling with changes in moisture content are limitations.

These Gladewater soils are in capability subclass Vw and woodland ordination group 2w6.

Iu—Iuka soils, frequently flooded. These deep, nearly level, loamy soils are on bottom lands along flood plains of the major rivers and streams. These soils are flooded at least once in two years. Slopes range from 0 to 2 percent. Soil areas are mostly long and narrow and range from 55 to 650 acres. The texture of the surface layer of these soils is variable. It is fine sandy loam, sandy loam, or loam. The soils do not occur in a regular pattern within a mapped area.

Typically, the surface layer is strongly acid fine sandy loam about 14 inches thick that is dark grayish brown in the upper part and brown in the lower part. To a depth of 34 inches the soil is very strongly acid, light yellowish brown fine sandy loam that has mottles of light gray. The underlying material to a depth of 64 inches is very strongly acid, light yellowish brown loamy fine sand that grades to fine sand below a depth of 45 inches.

Iuka soils are moderately well drained. Runoff is slow, and permeability is moderate. The available water capacity is high. Flooding is usually of short duration, and in some years flooding does not occur. The water table is at a depth of about 1 to 3 feet during the winter and spring.

Included in mapped areas of this soil are Ochlockonee, Mantachie, Bleakwood, and Mooreville soils. The Ochlockonee and Mooreville soils are on about the same or slightly higher landforms than Iuka soils. Mantachie and Bleakwood soils are on slightly lower areas. Also, a soil with sandy layers throughout is in some areas. These soils make up 15 to 20 percent of any mapped area.

Most areas of these soils are in woodland. The potential productivity for pine and hardwood trees is very high. Dominant trees are loblolly pine, sweetgum, and water oak. Because of wetness and flooding, harvesting operations are best done during dry periods.

These soils have medium potential for the production of understory plants that can be grazed by livestock and game animals. Wetness and an increased overstory of hardwoods reduces the production of forage plants. Major understory plants are pinehill bluestem, beaked panicum, low panicum, sedges, waxmyrtle, longleaf uniola, and greenbrier.

Some areas of these soils are used as pasture. The potential for pasture and hayland plants is high. The main limitation is wetness. Proper fertilization, liming, and grazing management are necessary for best production of improved bermudagrass and bahiagrass, arrowleaf clover, white clover, and vetch.

These soils are not suited to urban uses. The limitations are flooding and wetness.

These soils are in capability subclass Vw and woodland ordination group 1w8.

JaA—Jasco silt loam, 0 to 1 percent slopes. These moderately deep, loamy soils on uplands are on low, depressional areas that have nearly level surfaces (fig. 8). Slopes are less than 1 percent. Soil areas are oval to irregular in shape and range from 35 to 64 acres.

Typically, the surface layer is strongly acid, brown silt loam about 4 inches thick. The next layer is very strongly acid, light brownish gray silt loam. The upper part of the subsoil to a depth of 44 inches is very strongly acid, grayish brown loam. The fragipan layer is about 80 percent brittle masses. The lower part of the subsoil to a depth of 65 inches is very strongly acid silty clay loam that is mottled with brownish yellow and light brownish gray.

This Jasco soil is ponded at times. Permeability is very slow. The water table is at or near the surface for 6 to 9 months of the year.

Included with this soil in mapping are small areas of Evadale and Waller soils. These soils are on similar landscape positions as the Jasco soil, but they do not have nearly impervious, brittle lower layers. These included soils make up less than 5 percent of any mapped area.

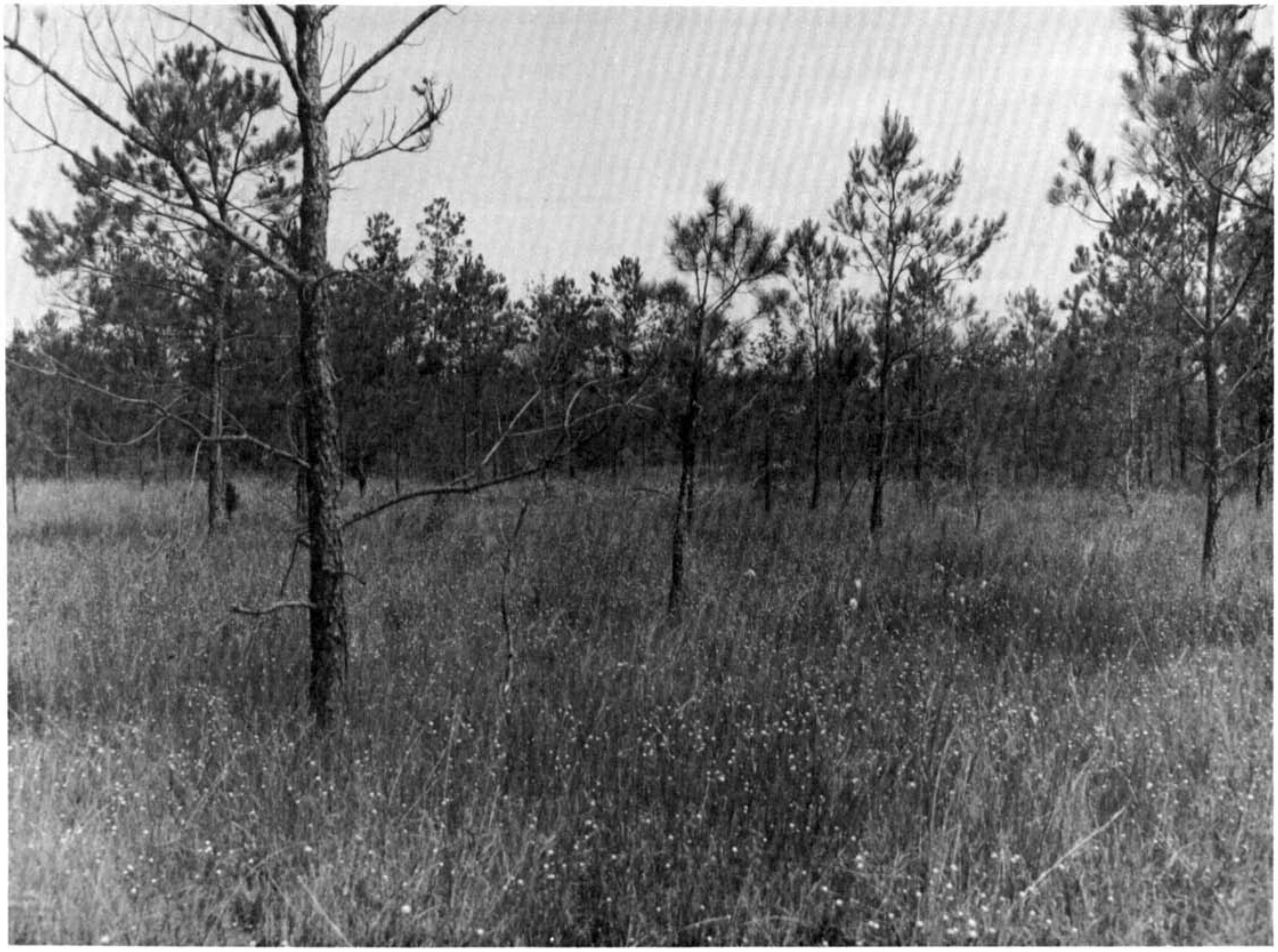


Figure 8.—An area of Jasco silt loam, 0 to 1 percent slopes.

Areas of this Jasco soil are used mainly as woodland and pasture. The potential productivity for pine and hardwood trees is very low. Dominant trees are shortleaf pine and loblolly pine, which are widely scattered. Some areas are planted to slash pine. The main limitations are the shallow rooting depth caused by the brittle fragipan layer and wetness, which inhibits the root growth of pine trees. Excessive wetness is also a limitation for pine tree seedlings.

This soil has very high potential for the production of understory plants that can be grazed by livestock and game animals. Major understory plants are low panicum, Florida paspalum, switchgrass, sedges, Carolina jointtail, and threeawns.

The potential for pasture and hayland plants is very low. The main limitation is wetness. Proper grazing management is necessary for best production of native grass.

This soil is not suited to urban uses because of ponding and wetness.

This Jasco soil is in capability subclass VIw and woodland ordination group 5w0.

KJB—Kirbyville-Jasco association, gently undulating. These deep, loamy soils are on uplands on broad areas that have low mounds. Slopes range from 0 to 3 percent. Soil areas are irregular in shape and range from 50 to more than 400 acres.

This association is 60 to 70 percent Kirbyville soils, 25 to 35 percent Jasco soils, and 5 to 10 percent other soils. These percentages were determined by taking samples from random transects made across mapped areas.

Kirbyville soils are on low mounds that are 125 to 500 feet wide, 200 to 1,000 feet long, and 1 to 3 feet high. Jasco soils are in the low depressional areas. Other soils in this association are Malbis soils on slightly higher areas and Waller soils in low areas and some small drainageways.

Typically, the surface layer of Kirbyville soils is strongly acid, dark grayish brown fine sandy loam about 5 inches thick. The next layer to a depth of 22 inches is strongly acid, light yellowish brown fine sandy loam. The upper part of the subsoil to a depth of 34 inches is very strongly acid, light yellowish brown and brownish yellow sandy clay loam that is mottled with gray and has about 10 percent pockets and streaks of very fine sandy loam. The lower part of the subsoil to a depth of 72 inches is very strongly acid, brownish yellow sandy clay loam that is mottled with brown and gray and has about 20 percent pockets and streaks of very fine sandy loam.

Typically, the surface layer of Jasco soils is strongly acid, light brownish gray silt loam about 4 inches thick. The next layer to a depth of 23 inches is strongly acid, light brownish gray silt loam that is mottled with brownish yellow and yellowish brown. This layer is about 20 percent brittle masses. The upper part of the subsoil to a depth of 40 inches is very strongly acid, light gray silty clay loam that is about 60 percent brittle masses and has brownish and yellowish mottles. The lower part of the subsoil to a depth of 62 inches is very strongly acid, brownish yellow sandy clay loam that is mottled with red. This layer has about 15 percent pockets and streaks of very pale brown very fine sandy loam.

Kirbyville soils are somewhat poorly drained, and Jasco soils are very poorly drained. Permeability of the Kirbyville soils is moderate, and permeability of the Jasco soils is very slow. Runoff is slow on Kirbyville soils. Jasco soils are ponded much of the time. The available water capacity is high for the Kirbyville soils and medium for the Jasco soils. The Kirbyville soils have a high water table at a depth of 1.5 to 2.5 feet during the winter and spring in most years. The Jasco soils have a perched water table in most years during the fall, winter, and spring. In other years, the Jasco soils are ponded.

Areas of these soils are used mainly as woodland and pasture. The potential productivity for pine trees is very high on Kirbyville soils and very low on Jasco soils. The rooting depth is shallow in the Jasco soils because of the brittle, fragipan layer and wetness. Dominant trees are loblolly, longleaf, and shortleaf pines. Many fields and clear-cut areas are planted to slash pine.

The potential for the production of understory plants that can be grazed by livestock and game animals is medium for Kirbyville soils and very high for Jasco soils. Wetness and an increased overstory of hardwoods reduce the production of forage plants on Kirbyville soils. Major understory plants on Kirbyville soils are pinehill bluestem, yaupon, low panicum, sedges, waxmyrtle, and Carolina jessamine. Major understory plants on Jasco soils are low panicum, Florida paspalum, switchgrass, sedges, Carolina jointtail, and threeawns.

The potential for pasture and hayland plants is very high on Kirbyville soils and very low on Jasco soils. The main limitation is wetness. Proper fertilization, liming, and grazing management are necessary for best production of improved bermudagrass and bahiagrass, white clover, and singletary peas.

The potential is medium for urban uses of Kirbyville soils. Jasco soils are not suited to urban uses because of wetness and ponding.

The Kirbyville soils are in capability subclass IIw and woodland ordination group 1w2. The Jasco soils are in capability subclass VIw and woodland ordination group 5w0.

KWB—Kirbyville-Waller association, gently undulating. These deep, loamy soils are on uplands on broad, slightly concave areas and on middle to lower side slopes above drainageways. Slopes range from 0 to 4 percent. Soil areas are oblong to irregular in shape and range from 50 to 1,000 acres.

This association is 60 to 75 percent Kirbyville soils, 15 to 30 percent Waller soils, and 5 to 10 percent other soils. These percentages were determined by taking samples from random transects made across mapped areas.

Kirbyville soils are on broad, nearly level areas and middle and lower side slopes. Waller soils are on low areas along drainageways. Other soils in this association are small areas of Malbis soils on slightly higher areas, Evadale and Jasco soils on slightly lower and ponded areas, and, in some areas, a soil similar to Kirbyville soils that has a brittle, almost impervious layer at a depth of about 35 inches.

Typically, the Kirbyville soils have a surface layer of medium acid, grayish brown fine sandy loam about 5 inches thick. The next layer to a depth of 18 inches is strongly acid, very pale brown fine sandy loam. The upper part of the subsoil to a depth of 35 inches is strongly acid, light yellowish brown sandy clay loam that has pockets and streaks of very pale brown fine sandy loam. The lower part of the subsoil to a depth of 75 inches is strongly acid and very strongly acid sandy clay loam that is strong brown in the upper part and brownish yellow in the lower part. This layer has 35 to 40 percent pockets and streaks of light gray fine sandy loam and is 8 percent by volume plinthite.

Typically, the Waller soils have a surface layer of strongly acid very fine sandy loam about 6 inches thick. It is dark grayish brown in the upper part and grayish brown in the lower part. The next layer to a depth of 16 inches is strongly acid, light brownish gray very fine sandy loam. The upper part of the subsoil to a depth of 31 inches is very strongly acid, light brownish gray very fine sandy loam. The lower part of the subsoil to a depth of 64 inches is very strongly acid clay loam that is light brownish gray in the upper part and gray in the lower part. Vertical streaks of loam and very fine sandy loam are throughout the subsoil.

Kirbyville soils are somewhat poorly drained, and Waller soils are poorly drained. Permeability of Kirbyville and Waller soils is moderate. Runoff is slow on Kirbyville soils and slow to ponded on Waller soils. The available water capacity of the soils is high. The Kirbyville soils have a high water table at a depth of 1.5 to 2.5 feet during the winter and spring in most years. The Waller soils have a high water table above a depth of 2.5 feet from late in fall to late in spring.

Areas of these soils are used mainly as woodland and pasture. The potential for the production of pine trees is very high on Kirbyville soils. The potential for the production of pine and hardwood trees is high on Waller soils. Dominant trees are loblolly pine, longleaf pine, shortleaf pine, and sweetgum. Many old fields and clear-cut areas are planted to slash pine (fig. 9). The main limitation is wetness on the Waller soils.

These soils have medium potential for the production of understory plants that can be grazed by livestock and game animals. Wetness, plant competition, and an increased hardwood overstory reduce the production of forage plants. Major understory plants are pinehill bluestem, beaked panicum, yaupon, low panicum, greenbrier, sedges, waxmyrtle, longleaf uniola, and Carolina jessamine.

The potential for pasture and hayland plants is very high for Kirbyville soils and medium for Waller soils. The main limitation is wetness. Proper fertilization, liming, and grazing management are necessary for best production of improved bermudagrass and bahiagrass, crimson clover, arrowleaf clover, and vetch.

The potential for urban uses is medium for Kirbyville soils and low for Waller soils. The main limitation is wetness. Low strength is a limitation for local roads and streets.

The Kirbyville soils are in capability subclass IIw and woodland ordination group 1w2. The Waller soils are in capability subclass VIw and woodland ordination group 2w9.

KAE—Kisatchie-Rayburn association, hilly. These moderately deep, loamy soils are on uplands on ridges and side slopes above drainageways. Slopes range from 5 to 20 percent. Soil areas are irregular in shape and range from 30 to 430 acres.

This association is 55 to 60 percent Kisatchie soils, 20 to 30 percent Rayburn soils, and 15 to 25 percent other soils. These percentages were determined by taking samples from random transects made across mapped areas.

Kisatchie soils are on concave, lower side slopes and foot slopes. Rayburn soils are mostly on ridges and upper, convex side slopes. Other soils in this association are small areas of Browndell soils on crests of ridges and more sloping side slopes, Corrigan soils on smooth concave areas, and Letney soils on the tops of some ridges and knolls. Some mapped areas have rock outcrops.

Typically, the surface layer of Kisatchie soils is very strongly acid fine sandy loam about 5 inches thick. It is dark grayish brown in the upper part and grayish brown in the lower part. The subsoil to a depth of 35 inches is very strongly acid clay that is grayish brown in the upper part, light brownish gray in the middle part, and light gray in the lower part. The underlying material is light brownish gray siltstone.

Typically, the surface layer of Rayburn soils is strongly acid, dark grayish brown fine sandy loam about 5 inches thick. The upper part of the subsoil to a depth of 16 inches is very strongly acid clay that is mottled with reds and browns. The lower part of the subsoil to a depth of 42 inches is very strongly acid clay that is mottled with strong brown, dark grayish brown, and grayish brown. The underlying material to a depth of 60 inches is extremely acid, pale brown, weakly consolidated, tuffaceous siltstone.

Kisatchie soils are well drained, and Rayburn soils are moderately well drained. Runoff is slow to rapid, and permeability is very slow. The available water capacity is low for Kisatchie soils and medium for Rayburn soils. The Rayburn soils commonly have a perched water table at a depth of 2.5 to 4.5 feet during winter and spring.

Areas of these soils are used mainly as woodland. The potential productivity for pine and hardwood trees is medium. Dominant trees are loblolly pine, shortleaf pine, longleaf pine, red oak, and sweetgum. Some areas are planted to slash pine. The main limitation is slow growth and pine seedling mortality caused by the clayey subsoil. The use of equipment is limited because of seasonal wetness. Harvesting operations can be done during dry periods. These soils have a severe hazard of erosion if all vegetation is removed.

These soils have very high potential for the production of understory plants that can be grazed by livestock and game animals. Major understory plants are pinehill bluestem, splitbeard bluestem, waxmyrtle, switchgrass, longleaf uniola, and sedges.

Some areas of these soils are used as pasture. The potential for pasture and hayland plants is low. The main limitation is the dense, clayey subsoil. Proper fertilization, liming, and grazing management are necessary for best production of improved bermudagrass and bahiagrass, crimson clover, arrowleaf clover, and vetch.

The potential is low for urban uses of these soils. The main limitations are wetness and the shrinking and swelling of the soil with changes in moisture content. Low strength is a limitation for local roads and streets.

These soils are in capability subclass VIe and woodland ordination group 3c8.

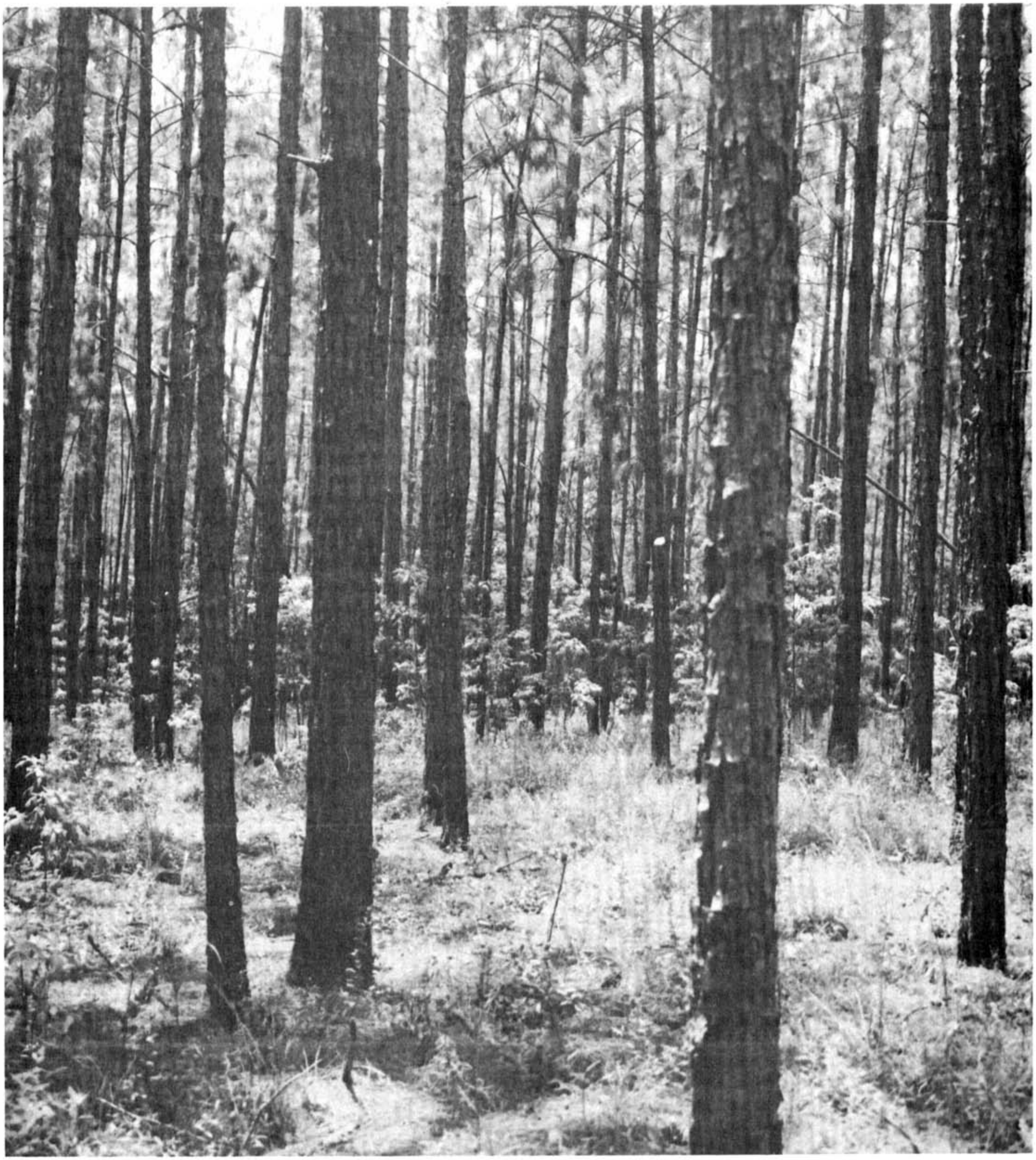


Figure 9.—A well managed stand of slash pine in an area of Kirbyville-Waller association, gently undulating.

LTC—Letney-Tehran association, undulating. These deep, sandy soils are on uplands on broad ridges and side slopes above drainageways. They occupy most of the highest land forms in the survey area. Slopes range from 1 to 8 percent. Soil areas are irregular in shape and range from 40 to 800 acres.

This association is 40 to 50 percent Letney soils, 20 to 30 percent Tehran soils, and 30 to 35 percent other soils. These percentages were determined by taking samples from random transects made across mapped areas.

Letney soils are mostly on ridges and the upper, convex side slopes. Tehran soils are mostly on the concave, lower side slopes. Other soils in this association are small areas of Stringtown, Pinetucky, and Bonwier soils, mostly on ridgetops; Newco soils, mostly on side slopes; and, in some mapped areas, a soil on the lower side slopes that is sandy throughout.

Typically, the surface layer of Letney soils is strongly acid, loamy fine sand about 9 inches thick. It is dark grayish brown in the upper part and grayish brown in the lower part. The next layer to a depth of 34 inches is very strongly acid, very pale brown loamy sand. The subsoil to a depth of 70 inches is very strongly acid, reddish yellow sandy clay loam.

Typically, the surface layer of Tehran soils is strongly acid loamy sand about 10 inches thick. It is dark grayish brown in the upper part and grayish brown in the lower part. The next layer to a depth of 44 inches is very strongly acid, very pale brown loamy sand. The subsoil to a depth of 70 inches is very strongly acid, reddish yellow sandy clay loam.

Letney soils are well drained, and Tehran soils are somewhat excessively drained. Permeability of the soils is moderately rapid. Runoff is slow. The available water capacity is medium for Letney soils and low for Tehran soils.

Areas of these soils are used mainly as woodland. The potential productivity for pine trees is medium. Dominant trees are loblolly, shortleaf, and longleaf pines. Many old fields and clear-cut areas are planted to slash pine. The main limitation for growing pines is the seedling mortality caused by droughtiness.

These soils have medium potential for the production of understory plants that can be grazed by livestock and game animals. Droughtiness and low soil fertility reduce the production of forage plants. Major understory plants on these soils are pinehill bluestem, low panicum, pineywoods dropseed, splitbeard bluestem, longleaf uniola, tickclover, threeawns, and American beautyberry.

The potential for pasture and hayland plants is medium on Letney soils and low on Tehran soils. The main limitation is the droughty, sandy surface layer. Proper fertilization, liming, and grazing management are necessary for best production of improved bermudagrass and bahiagrass, crimson clover, arrowleaf clover, and vetch.

The potential is high for urban uses of these soils. The main limitation is slope.

The Letney soils are in capability subclass IIIs and woodland ordination group 2s3. The Tehran soils are in capability subclass IVe and woodland ordination group 3s3.

MaB—Malbis fine sandy loam, 1 to 5 percent slopes. These deep, loamy soils on uplands are on broad, slightly convex areas and on middle to upper side slopes of ridges. Slopes range from 1 to 5 percent. Soil areas are oblong to irregular in shape and range from 50 to more than 1,000 acres.

Typically, the surface layer is strongly acid fine sandy loam about 13 inches thick that is dark grayish brown in the upper part and grayish brown in the lower part. The subsoil extends to a depth of 72 inches or more. The upper part of the subsoil to a depth of 36 inches is strongly acid to very strongly acid, yellowish brown sandy clay loam. The middle part to a depth of 54 inches is very strongly acid, yellowish brown sandy clay loam that has red and brown mottles. It is about 10 percent by volume plinthite. The lower part of the subsoil to a depth of 72 inches is very strongly acid, yellowish brown sandy clay loam that has mottles in shades of brown, yellow, and gray. It is about 10 percent by volume plinthite.

This Malbis soil is moderately well drained. Runoff is slow. Permeability is moderately slow. The available water capacity is high. These soils generally have a perched water table at a depth of 2.5 to 4.0 feet during the winter and spring.

Included with this soil in mapping are areas of Kirbyville, Waller, and Rogan soils. Kirbyville soils are on lower positions than the Malbis soil. Waller soils are in drainageways and low areas. Rogan soils are on upper side slopes and have a gravelly surface layer. These included soils make up 10 to 15 percent of any mapped area.

Areas of this Malbis soil are used mainly as woodland and pasture. The potential productivity for pine and hardwood trees is very high. Dominant trees are loblolly, longleaf, and shortleaf pines and mixed hardwoods. Many old fields and clear-cut areas are planted to slash pine.

The potential for the production of understory plants that can be grazed by livestock and game animals is low. Plant competition, wetness, and rapid changes in the overstory reduce forage plant production. Major understory plants are pinehill bluestem, splitbeard bluestem, threeawn, brownseed paspalum, yaupon, greenbrier, and pineywoods dropseed.

The potential for pasture and hayland plants is very high (fig. 10). Proper fertilization, liming, and grazing management are necessary for best production of improved bermudagrass and bahiagrass, crimson clover, arrowleaf clover, white clover, and vetch.

The potential for urban uses of this soil is medium because of wetness. Low strength is a limitation for local roads and streets.

This Malbis soil is in capability subclass IIIe and woodland ordination group 1o7.

MKB—Malbis-Kirbyville association, gently undulating. These deep, loamy soils are on uplands on broad areas that have a slightly mounded surface. Slopes range from 1 to 5 percent. Soil areas are long to irregular in shape and range from 42 to 1,400 acres.

This association is 50 to 60 percent Malbis soils, 30 to 40 percent Kirbyville soils, and 10 to 20 percent other soils. These percentages were determined by taking samples from random transects made across mapped areas.

Malbis soils are mostly on low mounds. Kirbyville soils are on concave surfaces in areas between mounds. Other soils in this association are small areas of Waller and Jasco soils on small, oval areas that are slightly lower than the Malbis and Kirbyville soils.

Typically, the surface layer of Malbis soils is medium acid, grayish brown fine sandy loam about 5 inches thick. The next layer to a depth of 24 inches is strongly acid, light yellowish brown fine sandy loam. The subsoil, is very strongly acid, brownish yellow sandy clay loam. The upper part of the subsoil to a depth of 48 inches is mottled with red. The lower part of the subsoil to a depth of 72 inches is mottled with red and gray. The upper part of the subsoil is 5 percent plinthite, and the lower part is 8 percent plinthite.

Typically, the surface layer of Kirbyville soils is medium acid fine sandy loam about 12 inches thick. It is light brownish gray in the upper part and light yellowish brown in the lower part. The subsoil to a depth of 65 inches or more is strongly acid, brownish yellow sandy clay loam. To a depth of 38 inches it has about 15 percent by volume pockets and streaks of light yellowish brown fine sandy loam and is about 5 percent plinthite in the lower part. To a depth of 65 inches it has about 35 percent by volume pockets and streaks of light gray fine sandy loam and is about 8 percent plinthite.

Malbis soils are moderately well drained, and Kirbyville soils are somewhat poorly drained. Permeability of the Malbis soils is moderately slow, and permeability of the

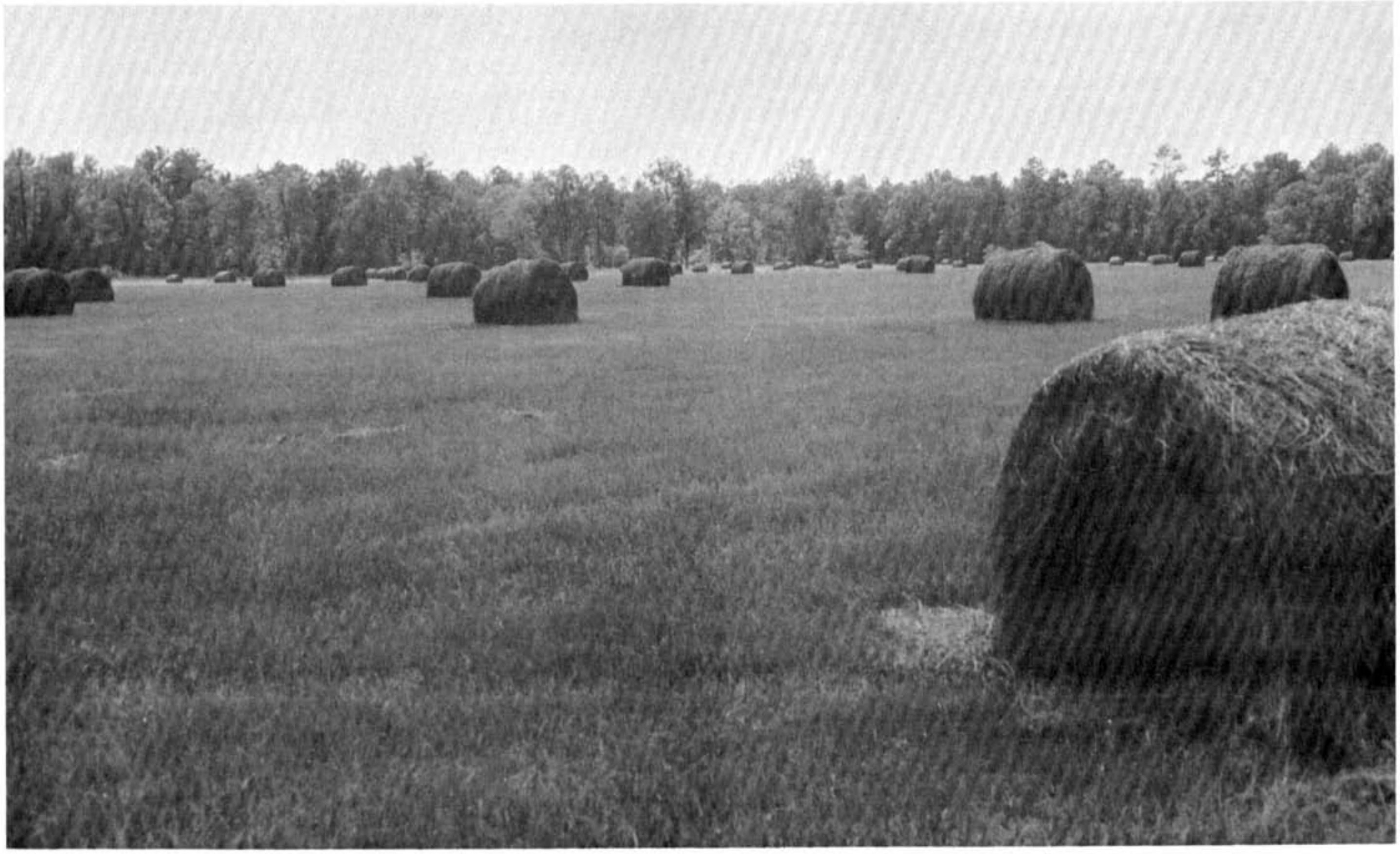


Figure 10.—Baled bahiagrass in an area of Malbis fine sandy loam, 1 to 5 percent slopes.

Kirbyville soils is moderate. Runoff is slow, and the available water capacity is high. These soils commonly have a perched water table at a depth of 1.5 to 4.0 feet during spring and winter.

Areas of these soils are used mainly as woodland and pasture. The potential productivity for pine and hardwood trees is very high. Dominant trees are loblolly, longleaf, and shortleaf pines and mixed hardwoods. Many old fields and clear-cut areas are planted to slash pine.

The potential for the production of understory plants that can be grazed by livestock and game animals is low for Malbis soils and medium for Kirbyville soils. Plant competition, wetness, and rapid changes in the overstory reduce the production of forage plants. Major understory plants on these soils are pinehill bluestem, splitbeard bluestem, longleaf uniola, low panicum, Carolina jessamine, sedges, yaupon, greenbrier, waxmyrtle, and pineywoods dropseed.

The potential for pasture and hayland plants is very high. Proper fertilization, liming, and grazing management are necessary for best production of improved bermudagrass and bahiagrass, crimson clover, arrowleaf clover, white clover, and vetch.

The potential is medium for urban uses of these soils. The main limitation is wetness. Low strength is a limitation for local roads and streets.

The Malbis soils are in capability subclass IIe and woodland ordination group 1o7. The Kirbyville soils are in capability subclass IIw and woodland ordination group 1w2.

Mn—Mantachie and Bleakwood soils, frequently flooded. These deep, loamy soils are on broad bottom lands of the major flood plains of rivers and the larger streams. Most areas have been cut by old stream channels. Slopes range from 0 to 2 percent. These soils are flooded at least once in two years. Soil areas are long and narrow and range from 40 to 450 acres.

This undifferentiated group is 45 to 65 percent Mantachie soils, 25 to 40 percent Bleakwood soils, and 5 to 10 percent other soils. These percentages were determined by taking samples from random transects made across mapped areas.

Mantachie soils are on broad, nearly level areas. Bleakwood soils are on slight depressions, mainly the remnants of old channels that have filled with soil material. Other soils in this map unit are Iuka and Mooreville soils and a soil, on slightly higher landforms along streams, that is sandy throughout.

Typically, the surface layer of Mantachie soils is strongly acid, dark grayish brown loam about 8 inches thick. The subsoil extends to a depth of 60 inches or more. To a depth of 35 inches it is very strongly acid sandy clay loam that is yellowish brown in the upper part and light brownish gray in the lower part. To a depth of 51 inches the subsoil is very strongly acid, light gray clay loam. To a depth of 60 inches the subsoil is very strongly acid, light gray fine sandy loam.

Typically, the surface layer of Bleakwood soils is slightly acid, dark grayish brown fine sandy loam that is 3 inches thick. The upper part of the subsoil to a depth of 45 inches is very strongly acid, light brownish gray loam. The lower part of the subsoil to a depth of 72 inches is very strongly acid, light brownish gray clay loam.

Mantachie soils are somewhat poorly drained, and Bleakwood soils are poorly drained. Permeability is moderate. Runoff is slow, and the available water capacity is high. The soils are commonly flooded at least once in two years. The water table is at or near the surface for several months, generally during the winter and spring.

Areas of these soils are used mainly as woodland. The potential productivity for hardwood trees is very high. Dominant trees are water oak and sweetgum. Because of wetness and flooding, harvesting operations can be done only during prolonged dry periods.

These soils have medium potential for the production of understory plants that can be grazed by livestock and game animals. Wetness and an increased overstory canopy reduce the production of forage plants. Major understory plants on these soils are pinehill bluestem, splitbeard bluestem, sedges, greenbrier, waxmyrtle, longleaf uniola, Florida paspalum, spreading panicum, and low panicum.

Some areas of these soils are used as pasture. The potential for pasture and hayland plants is high for Mantachie soils and very low for Bleakwood soils. The main limitation is wetness. Proper fertilization, liming, and grazing management are necessary for best production of improved bahiagrass, white clover, and singletary peas.

The soils are not suited to urban uses because of flooding and wetness.

These soils are in capability subclass Vw and woodland ordination group 1w6.

Mo—Melhomes soils, frequently flooded. These deep, nearly level and gently sloping, sandy soils are on poorly defined drains and lower slopes in drainageways. They are saturated throughout most of the year. Slopes are mostly 2 percent or less, but some areas on lower side slopes range to 5 percent. Soil areas are long and narrow and range from 40 to 375 acres. The texture of the surface layer is variable. It is loamy fine sand, loamy sand, or sand. These soils do not occur in a regular pattern within a mapped area.

Typically, Melhomes soils have a surface layer of very strongly acid loamy sand about 8 inches thick. It is black in the upper part and dark gray in the lower part. From 8 to 65 inches the soil is very strongly acid, gray sand.

Melhomes soils are poorly drained. Runoff is very slow, and permeability is rapid. These soils are ponded, or the water table is within a depth of 12 inches throughout the year. The soils are frequently flooded for brief periods.

Other soils are similar to the Melhomes soils except that they have a sandy clay loam layer at or below a depth of 40 inches. These soils make up 3 to 23 percent of any mapped area.

Areas of these soils are used mainly as woodland. The potential productivity for pine and hardwood trees is high. Dominant trees are loblolly pine, slash pine, and various hardwoods. The main limitation is wetness. Excess wetness limits the growth of pine seedlings. Harvesting operations are limited because of wetness and flooding.

These soils have low potential for the production of understory plants that can be grazed by livestock and game animals. Wetness and a thick canopy, mostly of hardwoods, reduce the production of forage plants. Major understory plants are beaked panicum, splitbeard bluestem, pinehill bluestem, sedges, waxmyrtle, and blackgum.

Some areas of these soils are used as pasture. The potential for pasture and hayland plants is low. The main limitation is wetness. Proper fertilization, liming, and grazing management are necessary for best production of improved bahiagrass, dallisgrass, tall fescue, hop clover, and singletary peas.

The soils are not suited to urban uses because of flooding and wetness.

These soils are in capability subclass Vw and woodland ordination group 2w9.

Mr—Mooreville soils, occasionally flooded. These deep, loamy soils are on broad bottom land areas on flood plains of the major rivers and along some of the larger streams. These soils are on nearly level areas that are flooded once every 2 to 5 years. Slopes range from 0 to 1 percent. Soil areas along streams are long and narrow, and soil areas on river bottom land areas are oblong. Mapped areas range from 40 to 1,200 acres.

The texture of the surface layer of these soils is variable. It is loam, silt loam, sandy clay loam, or fine sandy loam. The soils do not occur in a regular pattern within a mapped area.

Typically, Mooreville soils have a surface layer of strongly acid loam about 12 inches thick. It is very dark grayish brown in the upper part and brown in the lower part. The subsoil extends to a depth of 64 inches. It is very strongly acid, brown loam mottled with gray to a depth of 20 inches. Below this is very strongly acid, yellowish brown sandy clay loam that has grayish mottles. The subsoil grades to fine sandy loam in the lower part. The underlying material to a depth of 70 inches is a very strongly acid, light brownish gray sandy loam.

Mooreville soils are moderately well drained. Runoff is slow, and permeability is moderate. The available water capacity is high. The high water table is at a depth of about 3 to 6 feet during winter and early in spring

Included with these soils in mapping are areas of Iuka, Mantachie, Ochlockonee, and Urbo soils. Ochlockonee soils are on slightly higher lying areas. Iuka, Mantachie, Urbo soils are on slightly lower lying areas and are frequently flooded. The included soils make up as much as 15 percent of any mapped area.

Most areas of these Mooreville soils are in woodland. The potential productivity for pine and hardwood trees is very high. The dominant trees are loblolly pine and mixed hardwoods. Excessive wetness causes pine seedling mortality. Because of wetness and occasional flooding, harvesting operations are restricted to dry periods.

These soils have medium potential for the production of understory plants that can be grazed by livestock and game animals. Wetness and an increased overstory of hardwoods reduce the production of forage plants. Major plants are pinehill bluestem, yaupon, splitbeard bluestem, longleaf uniola, sedges, waxmyrtle, greenbrier, and Carolina jessamine.

Some areas of these soils are used for pasture. The potential for pasture and hayland plants is high. The main limiting factor is wetness. Proper fertilization, liming, and grazing management are necessary for the best production of improved bermudagrass and bahiagrass, arrowleaf clover, white clover, and vetch.

These soils are not suited to urban uses because of flooding and wetness.

These Mooreville soils are in capability subclass IIw and woodland ordination group 1w8.

NEB—Newco-Urland association, gently undulating. These deep, loamy soils on uplands are on broad ridges and their side slopes. Slopes range from 1 to 5 percent. Soil areas are irregular and range from 32 to 500 acres.

This association is 60 to 70 percent Newco soils, 20 to 30 percent Urland soils, and 10 to 15 percent other soils. These percentages were determined by taking samples from random transects made across mapped areas.

Newco soils are mostly on broad ridges and their side slopes. Urland soils are mostly on ridges and upper side slopes. Other soils in this association are small areas of Boykin and Pinetucky soils on ridgetops.

Typically, the surface layer of Newco soils is strongly acid fine sandy loam about 10 inches thick. It is very dark grayish brown in the upper part and grayish brown in the lower part. The subsoil to a depth of 48 inches is very strongly acid clay that is yellowish red in the upper part, strong brown in the middle part, and light gray in the lower part. To a depth of 80 inches the soil is very strongly acid, light gray sandy clay loam that is mottled with red.

Typically, the surface layer of Urland soils is strongly acid fine sandy loam about 17 inches thick. It is dark grayish brown in the upper part and brown in the lower part. The upper part of the subsoil to a depth of 22 inches is very strongly acid, yellowish red clay loam. The lower part of the subsoil to a depth of 50 inches is very strongly acid, red clay loam. The underlying material to a depth of 65 inches is very strongly acid, mottled red and gray, soft sandstone and shale.

Newco soils are moderately well drained; runoff is medium or slow, and permeability is slow. Urland soils are well drained; runoff is medium or rapid, and permeability is moderately slow. The available water capacity of these soils is high.

Areas of these soils are used mainly as woodland. The potential productivity for pine and hardwood trees is high. Dominant trees are loblolly pine, shortleaf pine, red oak, and sweetgum. Many areas are planted to slash pine. The main limitation is the clayey subsoil layers. There is an erosion hazard if these soils are left unprotected.

The potential for the production of understory plants that can be grazed by livestock and game animals is high for Newco soils and low for Urland soils. Plant competition and an increased overstory canopy reduce the production of forage plants. Major understory plants on these soils are longleaf uniola, waxmyrtle, slender bluestem, pinehill bluestem, pineywoods dropseed, American beautyberry, sedges, and yaupon.

Some areas of these soils are used as pasture. The potential for pasture and hayland plants is high on Newco soils and very high on Urland soils. The main limitation is the dense, clayey subsoil. Proper fertilization, liming, and grazing management are necessary for best production of improved bermudagrass and bahiagrass, crimson clover, arrowleaf clover, and vetch.

The potential for urban uses is low on the Newco soils and medium on the Urland soils. The main limitation is the shrinking and swelling of the soil with changes in moisture content. Low strength is a limitation for local roads and streets.

These soils are in capability subclass IIIe. The Newco soils are in woodland ordination group 2c8, and the Urland soils are in woodland ordination group 2o1.

NEE—Newco-Urland association, hilly. These deep, loamy soils are on ridges and side slopes on uplands. Slopes range from 5 to 20 percent. Soil areas are irregular in shape and range from 45 to 600 acres.

This association is 60 to 70 percent Newco soils, 25 to 30 percent Urland soils, and 5 to 10 percent other soils. These percentages were determined by taking samples from random transects made across mapped areas.

Newco soils are mostly on side slopes. Urland soils are mostly on the ridges and upper side slopes. Other soils in this association are small areas of Pinetucky soils on ridgetops.

Typically, Newco soils have a surface layer of strongly acid fine sandy loam about 8 inches thick. It is dark grayish brown in the upper part and brown in the lower part. The subsoil extends to a depth of 48 inches. It is very strongly acid, yellowish red clay loam to a depth of 20 inches; very strongly acid, yellowish red clay that is mottled with gray to a depth of 36 inches; and very strongly acid, light gray clay mottled with red and yellow to a depth of 48 inches. The underlying material to a depth of 65 inches is very strongly acid, light gray sandy clay loam that is mottled with red and yellow.

Typically, the surface layer of Urland soils is very strongly acid, brown fine sandy loam about 7 inches thick. It is dark grayish brown in the upper part and light yellowish brown in the lower part. The subsoil to a depth of 44 inches is very strongly acid, red sandy clay that is sandy clay loam below a depth of 30 inches. The underlying material to a depth of 65 inches is very strongly acid, yellowish red, soft sandstone that has layers of shale. It is mottled with red, yellow, and gray.

Newco soils are moderately well drained; runoff is medium or slow, and permeability is slow. Urland soils are well drained; runoff is medium or rapid, and permeability is moderately slow. The available water capacity of these soils is high.

Areas of these soils are used mainly as woodland. The potential productivity for pine and hardwood trees is high. Dominant trees are loblolly pine, shortleaf pine, red oak, and sweetgum. Many areas are planted to slash pine. The main limitation is the clayey subsoil layers. There is an erosion hazard if these soils are left unprotected.

The potential for the production of understory plants that can be grazed by livestock and game animals is high for Newco soils and low for Urland soils. Plant competition and an increased overstory canopy reduce the production of forage plants. Major understory plants are longleaf uniola, waxmyrtle, slender bluestem, pinehill bluestem, pineywoods dropseed, American beautyberry, sedges, and yaupon.

Some areas of these soils are used as pasture. The potential for pasture and hayland plants is medium. The main limitation is the dense, clayey subsoil. Proper fertilization, liming, and grazing management are necessary for best production of improved bermudagrass and bahiagrass, crimson clover, and arrowleaf clover.

The potential is low for urban uses of these soils. The main limitations are slope and the shrinking and swelling of the soil with changes in moisture content. Low strength is a limitation for local roads and streets.

These soils are in capability subclass VIe. The Newco soils are in woodland ordination group 2c8, and the Urland soils are in woodland ordination group 2o1.

NfC—Nikful fine sandy loam, 0 to 8 percent slopes. This deep, nearly level to sloping, loamy soil is on uplands. Slopes are mainly less than 3 percent, but they range up to 8 percent near streams. Soil areas are mostly oblong to irregular in shape and range from about 40 to 200 acres.

Typically, the surface layer is strongly acid, dark grayish brown fine sandy loam about 8 inches thick. The next layer to a depth of 18 inches is medium acid, light yellowish brown fine sandy loam. The subsoil extends to a depth of 48 inches. It is medium acid to very strongly acid clay that is light yellowish brown in the upper part, grayish brown in the middle part, and light brownish gray in the lower part. The underlying material to a depth of 60 inches is extremely acid, very pale brown volcanic tuff.

This Nikful soil is somewhat poorly drained. Runoff is slow to rapid. Permeability is very slow. The available water capacity is medium. The soil commonly has a perched water table above a depth of 3.5 feet during the winter and spring.

Included with this soil in mapping are areas of Rayburn and Corrigan soils. Rayburn soils are on slightly higher lying areas than the Nikful soil. Corrigan soils are on similar and slightly lower lying areas. These included soils make up less than 15 percent of any mapped area.

Most areas of this Nikful soil are in woodland. The potential productivity for pine trees is very high. Dominant trees are longleaf pine and loblolly pine. Wetness causes pine seedling mortality. Because of seasonal wetness, harvesting operations are restricted to dry periods.

This soil has medium potential for the production of understory plants that can be grazed by livestock and game animals. Wetness and an increased overstory reduce forage plant production. Major understory plants are pinehill bluestem, yaupon, low panicum, splitbeard bluestem, sedges, waxmyrtle, Carolina jessamine, and greenbrier.

Some areas of this soil are used as pasture. The potential for pasture and hayland plants is very high. Proper fertilization, liming, and grazing management are necessary for best production of improved bermudagrass and bahiagrass, crimson clover, arrowleaf clover, and vetch.

The potential is low for urban uses of this soil. The main limitations are wetness and the shrinking and swelling of the soil with changes in moisture content.

This Nikful soil is in capability subclass IIw and woodland ordination group 1w2.

NKB—Niwana-Kirbyville association, gently undulating. These deep, loamy soils on uplands are on broad, mounded areas and slightly concave middle to lower side slopes above drainageways. Slopes range from 0 to 3 percent. Soil areas are oblong to irregular in shape and range from 40 to 430 acres.

This association is 50 to 55 percent Niwana soils, 30 to 40 percent Kirbyville soils, and 5 to 15 percent other soils. These percentages were determined by taking samples from random transects made across mapped areas.

Niwana soils are on mounds 18 to 34 inches high and 50 to 200 feet across. Kirbyville soils are on concave, intermound areas. Other soils in this association are small areas of Malbis soils on slightly higher areas and upper side slopes and Waller soils on the low depressions.

Typically, the surface layer of Niwana soils is medium acid, dark grayish brown fine sandy loam about 4 inches thick. The next layer to a depth of 25 inches is strongly acid, pale brown fine sandy loam. The subsoil to a depth of 75 inches is very strongly acid, brownish yellow sandy clay loam that has about 15 percent by volume pockets and streaks of light gray fine sandy loam.

Typically, the surface layer of Kirbyville soils is strongly acid fine sandy loam about 10 inches thick. It is very dark gray in the upper part and brown in the lower part. The subsoil to a depth of 18 inches is strongly acid, light yellowish brown sandy clay loam that has about 15 percent pockets and streaks of light gray fine sandy loam. The subsoil to a depth of 72 inches is very strongly acid, brownish yellow sandy clay loam that has pockets and streaks of light gray fine sandy loam. This layer is about 5 percent by volume plinthite.

Niwana soils are moderately well drained, and Kirbyville soils are somewhat poorly drained. Runoff is slow. Permeability is moderate, and the available water capacity is high. A high water table is at a depth of about 1.5 to 2.5 feet in Kirbyville soils and about 4 to 6 feet in Niwana soils during the winter and spring.

Areas of these soils are used mainly as woodland and pasture. The potential productivity for pine and hardwood trees is very high. Dominant trees are longleaf, loblolly, and slash pines and mixed hardwoods. Because of wetness on Kirbyville soils, harvesting operations are best done during dry periods.

The potential for the production of understory plants that can be grazed by livestock and game animals is low for Niwana soils and medium for Kirbyville soils. Plant competition, rapid changes in the overstory, and wetness reduce the production of forage plants. Major understory plants are pinehill bluestem, splitbeard bluestem, American beautyberry, low panicum, Carolina jessamine, slender bluestem, sedges, yaupon, greenbrier, and waxmyrtle.

Some areas of these soils are used as pasture. The potential for pasture and hayland plants is very high. Proper fertilization, liming, and grazing management are necessary for best production of improved bermudagrass and bahiagrass, crimson clover, arrowleaf clover, and vetch.

The potential for most urban uses is medium. The main limitation is wetness. Low strength is a limitation for local roads and streets.

These soils are in capability subclass IIw. The Niwana soils are in woodland ordination group 1o7, and the Kirbyville soils are in woodland ordination group 1w2.

Oc—Ochlockonee soils, occasionally flooded. These deep, nearly level, loamy soils are on broad bottom land areas on flood plains of major rivers and along some larger streams. Slopes range from 0 to 1 percent. These soils are flooded once in 2 to 5 years. Soil areas along streams are long and narrow, and soil areas on river bottom lands are oblong. Areas range from 33 to 280 acres. The texture of the surface layer of these soils is variable. It ranges from fine sandy loam to loamy fine sand. These soils do not occur in a regular pattern within a mapped area.

Typically, Ochlockonee soils have a surface layer of slightly acid, dark brown fine sandy loam about 7 inches thick. The next layer to a depth of 21 inches is strongly acid, brown fine sandy loam. The underlying material is strongly acid, mottled brown and dark brown loam to a depth of 29 inches. To a depth of 52 inches it is very strongly acid loam that is dark yellowish brown in the upper part and strong brown in the lower part. To a depth of 60 inches it is strongly acid, pale brown fine sandy loam.

Ochlockonee soils are well drained. Runoff is slow. Permeability is moderate. The available water capacity is medium. The water table is mostly at a depth of 4 to 6 feet during the winter and early in spring.

Included with these soils in mapping are areas of Iuka, Mantachie, Mooreville, and Urbo soils. These soils are on slightly lower areas. The Urbo soils are frequently flooded.

Most areas of these Ochlockonee soils are in woodland. The potential productivity for pine and hardwood trees is very high. Dominant trees are loblolly pine and mixed hardwoods.

These soils have low potential for the production of understory plants that can be grazed by livestock and game animals. Plant competition and rapid changes in the overstory reduce the production of forage plants. Major understory plants are pinehill bluestem, splitbeard bluestem, American beautyberry, longleaf uniola, Carolina jessamine, yaupon, greenbrier, and waxmyrtle.

Some areas of these soils are used as pasture. The potential for pasture is high. The main limitation is wetness. Proper fertilization, liming, and grazing management are necessary for best production of improved bermudagrass and bahiagrass, arrowleaf clover, white clover, and vetch.

These soils are not suited to urban uses because of flooding.

These Ochlockonee soils are in capability subclass IIw and woodland ordination group 1o7.

PIC—Pinetucky-Doucette association, undulating. These deep, loamy and sandy soils are on broad ridges and side slopes on uplands. Slopes range from 1 to 8 percent. Soil areas are oblong to irregular in shape and range from 50 to about 950 acres.

This association is 70 to 80 percent Pinetucky soils, 5 to 15 percent Doucette soils, and 15 to 30 percent other soils. These percentages were determined by taking samples from random transects made across mapped areas.

Pinetucky soils are mostly on ridges and upper side slopes. Doucette soils are mostly on concave, lower slopes. Other soils in this association are small areas of Bonwier, Urland, and Stringtown soils on upper side slopes and ridges and Mantachie soils in small drainageways.

Typically, the surface layer of Pinetucky soils is very strongly acid fine sandy loam about 13 inches thick. It is grayish brown in the upper part and yellowish brown in the lower part. The subsoil to a depth of 65 inches is very strongly acid sandy clay loam that is strong brown in the upper part and yellowish brown in the lower part. The subsoil to a depth of 80 inches is very strongly acid, sandy clay loam that is yellowish brown in the upper part and brownish yellow in the lower part. This layer is mottled with red and gray. It is about 10 percent plinthite in the upper part. The percentage of plinthite decreases as depth increases.

Typically, the surface layer of Doucette soils is strongly acid, dark grayish brown loamy fine sand about 12 inches thick. The next layer to a depth of 26 inches is strongly acid, pale brown loamy sand. The upper part of the subsoil to a depth of 38 inches is very strongly acid, strong brown sandy clay loam. The lower part of the subsoil to a depth of 80 inches is very strongly acid, strong brown and reddish yellow sandy clay loam that is mottled with red. This layer is about 10 percent plinthite in the upper part. The percentage of plinthite decreases as depth increases.

Pinetucky soils are moderately well drained; runoff is slow or medium, and permeability is moderately slow. The available water capacity is high. Doucette soils are well drained; runoff is slow, and permeability is moderate. The available water capacity is medium.

Areas of these soils are used mainly as woodland and pasture. The potential productivity for pine trees is high. Dominant trees are loblolly, longleaf, and shortleaf pines. Many old fields and clear-cut areas are planted to slash pine. The main limitation is the droughtiness of the surface layer of the Doucette soils.

The potential for the production of understory plants that can be grazed by livestock and game animals is low for Pinetucky soils and medium for Doucette soils. Plant competition and rapid changes in canopies reduce the production of forage plants on Pinetucky soils. Low natural fertility and droughtiness reduce forage plant production on Doucette soils. Major understory plants are pinehill bluestem, splitbeard bluestem, brackenfern, Carolina jessamine, tickclover, greenbrier, American beautyberry, yaupon, and slender bluestem.

The potential for pasture and hayland plants is very high. Proper fertilization, liming, and grazing management are necessary for best production of improved bermudagrass and bahiagrass, crimson clover, arrowleaf clover, and white clover.

The potential is medium for most urban uses of these soils. The main limitation is slope in places. Low strength is a limitation for local roads and streets.

These soils are in capability subclass IIIe. The Pinetucky soils are in woodland ordination group 2o1, and the Doucette soils are in woodland ordination group 2s2.

RAB—Rayburn-Corrigan association, undulating. These deep and moderately deep, loamy soils are on ridges and middle to upper side slopes on uplands. Slopes range from 1 to 5 percent. Soil areas are oblong to irregular in shape and range from 30 to 260 acres.

This association is 50 to 75 percent Rayburn soils, 25 to 35 percent Corrigan soils, and 0 to 15 percent other soils. These percentages were determined by taking samples from random transects made across mapped areas.

Rayburn soils are mostly on convex ridges and upper side slopes. Corrigan soils are mostly on the concave lower areas and middle to lower side slopes. Other soils in this association are small areas of Browndell soils on small knolls and ridges and Nikful soils mostly on concave, lower slopes.

Typically, the surface layer of Rayburn soils is strongly acid fine sandy loam about 7 inches thick. It is dark grayish brown in the upper part and grayish brown in the lower part. The upper part of the subsoil to a depth of 18 inches is very strongly acid, dark reddish brown clay. The lower part of the subsoil to a depth of 47 inches is very strongly acid, brownish and grayish clay that has mottles of red and gray. The underlying material to a depth of 60 inches is very strongly acid, light brownish gray, tuffaceous siltstone.

Typically, the surface layer of Corrigan soils is strongly acid fine sandy loam about 8 inches thick. It is dark grayish brown in the upper part and grayish brown in the lower part. The subsoil to a depth of 40 inches is very strongly acid, grayish brown, light gray, and light olive brown clay that has mottles in shades of red and brown. The underlying material to a depth of 60 inches is extremely acid, gray, tuffaceous siltstone.

Rayburn soils are moderately well drained, and Corrigan soils are somewhat poorly drained. Runoff is slow to rapid, and permeability is very slow. The available water capacity is medium for Rayburn soils and low for Corrigan soils. The Rayburn soils have a perched water table at a depth of 2.5 to 4.5 feet, and the Corrigan soils have a perched water table above a depth of 3 feet in winter and spring in most years.

Areas of these soils are used mainly as woodland. The potential productivity for pine and hardwood trees is high for Rayburn soils and medium for Corrigan soils. Dominant trees are loblolly, shortleaf, and longleaf pines and mixed hardwoods. Some clear-cut areas are planted to slash pine. The main limitation is the clayey subsoil. Because of seasonal wetness, harvesting operations are best done during dry periods. These soils have an erosion hazard if left unprotected.

These soils have very high potential for the production of understory plants that can be grazed by livestock and game animals. Major understory plants are pinehill bluestem, splitbeard bluestem, waxmyrtle, switchgrass, low panicum, longleaf uniola, and sedges.

Some areas of these soils are used as pasture. The potential for pasture and hayland plants is low. The main limitation is the dense, clayey subsoil. Proper fertilization, liming, and grazing management are necessary for best production of improved bermudagrass and bahiagrass, crimson clover, arrowleaf clover, and vetch.

The potential is low for urban uses of these soils. The main limitations are wetness and the shrinking and swelling of the soil with changes in moisture content. Low strength is a limitation for local roads and streets.

These soils are in capability subclass IVe. The Rayburn soils are in woodland ordination group 2c8, and the Corrigan soils are in woodland ordination group 3c8.

RBE—Rayburn-Kisatchie association, hilly. These deep and moderately deep, loamy soils are on ridges and side slopes on uplands. Slopes are mostly 10 to 20 percent but range to 5 percent. Soil areas are irregular in shape and range from 30 to 320 acres.

This association is 50 to 60 percent Rayburn soils, 25 to 30 percent Kisatchie soils, and 15 to 25 percent other soils. These percentages were determined by taking samples from random transects made across mapped areas.

Rayburn soils are mostly on the convex ridges and upper side slopes. Kisatchie soils are mostly on the concave lower side slopes. Other soils in this association are small areas of Browndell soils on small knolls and ridges, Corrigan and Nikful soils on concave lower slopes, and Letney soils on the tops of higher ridges and knolls.

Typically, the surface layer of Rayburn soils is strongly acid fine sandy loam about 7 inches thick. It is very dark grayish brown in the upper part and dark grayish brown in the lower part. The upper part of the subsoil to a depth of 16 inches is very strongly acid, red clay. The lower part of the subsoil to a depth of 55 inches is clay that is very strongly acid and mottled in shades of brown, gray, and red. The underlying material to a depth of 65 inches is very strongly acid, light gray, tuffaceous sandstone.

Typically, the surface layer of Kisatchie soils is strongly acid fine sandy loam about 12 inches thick. It is dark grayish brown in the upper part and grayish brown in the lower part. The subsoil to a depth of 34 inches is very strongly acid, grayish and brownish clay that is mottled with yellowish brown. The underlying material to a depth of 60 inches is extremely acid, light yellowish brown and light gray, tuffaceous siltstone.

Rayburn soils are moderately well drained, and Kisatchie soils are well drained. Runoff is slow to very rapid, and permeability is very slow. The available water capacity is medium for Rayburn soils and low for Kisatchie soils. The Rayburn soils commonly have a perched water table at a depth of 2.5 to 4.5 feet during the winter and spring.

Areas of these soils are used mainly as woodland. The potential productivity for pine and hardwood trees is medium. Dominant trees are loblolly, shortleaf, and longleaf pines and mixed hardwoods. Some clear-cut areas are planted to slash pine. The main limitation is the clayey subsoil. Because of seasonal wetness, harvesting operations are best done during dry periods. There is an erosion hazard if the soils are left unprotected.

These soils have very high potential for the production of understory plants that can be grazed by livestock and game animals. Major understory plants on these soils are pinehill bluestem, splitbeard bluestem, waxmyrtle, switchgrass, longleaf uniola, and sedges.

Some areas of these soils are used as pasture. The potential for pasture and hayland plants is low. The main limitation is the dense, clayey subsoil. Proper fertilization, liming, and grazing management are necessary for best production of improved bermudagrass and bahiagrass, crimson clover, arrowleaf clover, and vetch.

The potential is low for urban uses of these soils. The main limitations are slope and the shrinking and swelling of the soil with changes in moisture content. Low strength is a limitation for local roads and streets.

These soils are in capability subclass VIe and woodland ordination group 3c8.

REB—Redco-Woodville association, gently undulating. These deep, clayey and loamy soils are on uplands on broad ridges and their side slopes. Slopes range from 0 to 5 percent. Soil areas are oblong to irregular in shape and range from 40 to nearly 1,000 acres.

This association is 75 to 85 percent Redco soils, 15 to 20 percent Woodville soils, and 0 to 10 percent other soils. These percentages were determined by taking samples from random transects made across mapped areas.

Redco soils are on the crests of ridges and upper convex side slopes. Woodville soils are mostly on the slightly concave foot slopes. Other soils in this map unit are small areas of Wiergate soils on slightly concave, lower side slopes. The Redco soils have gilgai microrelief. It is 8 to 15 feet between the center of a microknoll and a microdepression and the highs are 4 to 12 inches above the lows.

Typically, the Redco soils have a surface layer of strongly acid, dark brown clay about 5 inches thick. To a depth of 11 inches the soil is very strongly acid, yellowish brown clay that has grayish and reddish mottles. To a depth of 27 inches the soil is very strongly acid, light brownish gray clay mottled with red and brown. To a depth of 65 inches the soil is very strongly acid, gray clay that is mottled with red, yellow, and brown. This lower layer has many large, intersecting slickensides.

Typically, the surface layer of Woodville soils is strongly acid fine sandy loam about 9 inches thick. It is dark grayish brown in the upper part and brown in the lower part. The upper part of the subsoil to a depth of 19 inches is very strongly acid, yellowish red clay that is mottled with red and brown. The lower part of the subsoil to a depth of 65 inches is very strongly acid, light gray clay that is mottled with red and yellow.

Redco soils are poorly drained, and Woodville soils are somewhat poorly drained. Runoff is slow or medium. Permeability is very slow. The available water capacity is high. These Redco soils commonly have a high water table at a depth of 0 to 2 feet during spring and winter. The Woodville soils have a water table at a depth of 2.5 to 4 feet from fall to spring.

Areas of these soils are used mainly as woodland and pasture. The potential productivity for pine and hardwood trees is medium on Redco soils and high on Woodville soils. Dominant trees are loblolly pine, shortleaf pine, red oak, and sweetgum. The main limitation is the clayey texture of the soils. Because of wetness, harvesting operations need to be timed to dry periods.

The potential for the production of understory plants that can be grazed by livestock and game animals is very high for Redco soils and high for Woodville soils. Plant competition and an overstory canopy reduce the production of forage plants on Woodville soils. Major understory plants are pinehill bluestem, switchgrass, waxmyrtle, splitbeard bluestem, slender bluestem, pineywoods dropseed, longleaf uniola, and sedges.

The potential for pasture and hayland plants is medium for Redco soils and high for Woodville soils. The main limitation is the dense, clayey subsoil. Proper fertilization, liming, and grazing management are necessary for best production of improved bermudagrass and bahiagrass, crimson clover, arrowleaf clover, white clover, and vetch.

The potential is low for urban uses of these soils. The main limitations are wetness and the shrinking and swelling of the soil with changes in moisture content. Low strength is a limitation for local roads and streets.

These soils are in capability subclass IVe. The Redco soil is in woodland ordination group 3c8, and the Woodville soil is in woodland ordination group 2c8.

RPB—Rogan-Pinetucky association, gently undulating. These deep, loamy soils are on uplands on broad ridges and the middle and upper side slopes. Slopes range from 1 to 5 percent. Soil areas are oblong to irregular in shape and range from 40 to about 500 acres. Some areas are mined for the ironstone gravel in the surface layer.

This association is 70 to 85 percent Rogan soils, 10 to 30 percent Pinetucky soils, and 0 to 10 percent other soils. These percentages were determined by taking samples from random transects made across mapped areas.

Rogan soils are mostly on middle and upper side slopes. Pinetucky soils are on the tops of broad ridges. Other soils in this association are Urland soils, mostly on upper side slopes.

Typically, the surface layer of Rogan soils is medium acid, grayish brown gravelly fine sandy loam about 8 inches thick. The next layer to a depth of 16 inches is medium acid, pale brown gravelly fine sandy loam. The subsoil extends to a depth of 65 inches or more. To a depth of 26 inches it is strongly acid, strong brown gravelly sandy clay loam that is about 30 percent ironstone. The subsoil to a depth of 65 inches is strongly acid, strong brown sandy clay loam that is 8 to 15 percent plinthite and has red and gray mottles below a depth of about 36 inches.

Typically, the surface layer of Pinetucky soils is strongly acid fine sandy loam about 14 inches thick. It is grayish brown in the upper part and pale brown in the lower part. The subsoil to a depth of 65 inches is very strongly acid, yellowish brown and brownish yellow sandy clay loam that is about 10 percent plinthite and has red and gray mottles below a depth of 46 inches.

Rogan and Pinetucky soils are moderately well drained. Runoff is slow to medium. Permeability is moderately slow. The available water capacity is high.

Areas of these soils are used mainly as woodland. The potential productivity for pine trees is medium on Rogan soils and high on Pinetucky soils. Dominant trees are loblolly, longleaf, and shortleaf pines. Many clear-cut areas are planted to slash pine.

The potential for the production of understory plants that can be grazed by livestock and game animals is medium for Rogan soils and low for Pinetucky soils. Plant competition and rapid changes in canopies reduce the production of forage plants. Major understory plants on these soils are pinehill bluestem, pineywoods dropseed, slender bluestem, sedges, greenbrier, American beautyberry, Carolina jessamine, and yaupon.

The potential for pasture and hayland plants is very high. Proper fertilization, liming, and grazing management are necessary for best production of improved bermudagrass and bahiagrass, crimson clover, arrowleaf clover, white clover, and vetch.

The potential for most urban uses is high for Rogan soils and medium for Pinetucky soils. Low strength is a limitation for local roads and streets.

These soils are in capability subclass IIIe. Rogan soils are in woodland ordination group 3o1, and Pinetucky soils are in woodland ordination group 2o1.

SBC—Shankler-Boykin association, undulating. These deep, sandy soils on uplands are on broad ridgetops and side slopes above drainageways. Slopes range from 1 to 8 percent. Soil areas are irregular in shape and range from 45 to 350 acres.

This association is 50 to 65 percent Shankler soils, 5 to 25 percent Boykin soils, and 25 to 45 percent other soils. These percentages were determined by taking samples from random transects made across mapped areas.

Shankler soils are mostly on broad ridges and mid to lower concave slopes. Boykin soils are mostly on mid to upper slopes. Other soils in this association are Doucette and Pinetucky soils on ridges and upper side slopes; Newco soils, mostly on mid side slopes; Melhomes soils on lower side slopes and drainageways; and a soil that is loamy sand to a depth of more than 80 inches on the lower side slopes in some areas.

Typically, the surface layer of Shankler soils is very strongly acid loamy fine sand about 12 inches thick. It is dark brown in the upper part and brown in the lower part. The next layer to a depth of 43 inches is very strongly acid loamy fine sand that is light yellowish brown in the upper part and very pale brown in the lower part. The subsoil to a depth of 80 inches is very strongly acid sandy clay loam that is red in the upper part and yellowish red in the lower part.

Typically, the surface layer of Boykin soils is strongly acid, brown loamy fine sand about 8 inches thick. The next layer to a depth of 26 inches is medium acid, yellowish brown loamy fine sand. The subsoil to a depth of 75 inches is very strongly acid, red sandy clay loam.

Shankler and Boykin soils are well drained or somewhat excessively drained. Runoff is slow. Permeability is moderate. The available water capacity is medium.

Areas of these soils are used mainly as woodland. The potential productivity for pine trees is high. Dominant trees are loblolly pine and shortleaf pine. There are a few longleaf pine in some areas. Some clear-cut areas are planted to slash pine. The main limitation for growing pine trees is seedling mortality caused by droughtiness.

These soils have medium potential for the production of understory plants that can be grazed by livestock and game animals. Droughtiness and low fertility reduce the production of forage plants. Major understory plants are pinehill bluestem, tickclover, splitbeard bluestem, threeawn, longleaf uniola, brackenfern, pineywoods dropseed, and American beautyberry.

Some areas of these soils are used as pasture. The potential for pasture and hayland plants is medium on Shankler soils and very high on Boykin soils. The main limitation is the droughty, sandy surface layer. Proper fertilization, liming, and grazing management are necessary for best production of improved bermudagrass, bahiagrass, and vetch.

The potential is high for most urban uses of these soils. The main limitation for urban uses is slope in places.

The Shankler soils are in capability subclass IIIs and woodland ordination group 2s3. The Boykin soils are in capability subclass IIIe and woodland ordination group 2s2.

SBE—Shankler-Boykin association, hilly. These deep, sandy soils on uplands are on narrow ridgetops and side slopes above drainageways. Slopes range from 8 to 20 percent. Soil areas are irregular in shape and range from 40 to 600 acres.

This association is 50 to 70 percent Shankler soils, 15 to 25 percent Boykin soils, and 20 to 25 percent other soils. These percentages were determined by taking samples from random transects made across mapped areas.

Shankler soils are mostly on the lower, concave side slopes. Boykin soils are mostly on convex, upper side slopes and ridgetops. Other soils in this association are small areas of Bonwier soils, mostly on ridgetops and the steeper side slopes; Melhomes soils on the lower slopes and drainageways; and Iuka soils in the drainageways.

Typically, the surface layer of Shankler soils is very strongly acid loamy fine sand about 12 inches thick. It is dark brown in the upper part and brown in the lower part. The next layer to a depth of 43 inches is very strongly acid loamy fine sand that is light yellowish brown in the upper part and very pale brown in the lower part. The subsoil to a depth of 80 inches is very strongly acid sandy clay loam that is red in the upper part and yellowish red in the lower part.

Typically, the surface layer of Boykin soils is strongly acid, dark grayish brown loamy fine sand about 8 inches thick. The next layer to a depth of 22 inches is medium acid, brown loamy fine sand. The subsoil to a depth of 72 inches is very strongly acid, red sandy clay loam.

Shankler and Boykin soils are well drained to somewhat excessively drained. Runoff is slow. Permeability is moderate. The available water capacity is medium.

Areas of these soils are used mainly as woodland. The potential productivity for pine trees is high. Dominant trees are loblolly pine and shortleaf pine. A few longleaf pine are in some areas. Some areas are planted to slash pine. The main limitation for growing pines is pine seedling mortality caused by droughtiness.

These soils have medium potential for the production of understory plants that can be grazed by livestock and game animals. Droughty soils and low fertility reduce the production of forage plants. Major understory plants are pinehill bluestem, tickclover, splitbeard bluestem, threeawn, longleaf uniola, brackenfern, pineywoods dropseed, and American beautyberry.

Some areas of these soils are used as pasture. The potential for pasture and hayland plants is low on the Shankler soils and very high on the Boykin soils. The main limitation is the droughty, sandy surface layer. Proper fertilization, liming, and grazing management are necessary for best production of improved bermudagrass, bahiagrass, and vetch.

The potential is low for urban uses of these soils. The main limitation is slope.

These soils are in capability subclass VIe. The Shankler soils are in woodland ordination group 2s3, and the Boykin soils are in woodland ordination group 2s2.

SMB—Spurger-Mollville association, gently undulating. These deep, loamy soils on terraces are on broad areas above the flood plains of the major rivers. Slopes range from 0 to 3 percent. Soil areas are irregular in shape and range from 50 to 750 acres.

This association is 65 to 75 percent Spurger soils, 10 to 25 percent Mollville soils, and 10 to 20 percent other soils. These percentages were determined by taking samples from random transects made across mapped areas.

Spurger soils are on slightly convex areas. Mollville soils are on slightly concave, lower areas that are generally long and narrow. Other soils in this association are Gallime and Bernaldo soils on similar positions as Spurger soils and Bienville and Besner soils on slightly higher areas.

Typically, the surface layer of Spurger soils is loam that is very strongly acid and about 9 inches thick. It is very dark grayish brown in the upper part and brown in the lower part. The subsoil extends to a depth of 65 inches. It is very strongly acid, reddish clay that has gray mottles to a depth of 36 inches; very strongly acid, yellowish red sandy clay loam that has gray mottles to a depth of 43 inches; and very strongly acid, yellowish red sandy clay loam to a depth of 65 inches. The underlying material to a depth of 80 inches is brownish yellow, very strongly acid sand.

Typically, the surface layer of Mollville soils is strongly acid, grayish silt loam about 15 inches thick. The upper part of the subsoil to a depth of 35 inches is strongly acid, light brownish gray silty clay loam that has pockets and streaks of silt loam. The lower part of the subsoil to a depth of 68 inches is very strongly acid, light brownish gray and strong brown clay loam that has pockets and streaks of light gray silt loam. The underlying material to a depth of 75 inches is strongly acid, mottled light gray and strong brown sandy clay loam.

Spurger soils are moderately well drained, and Mollville soils are poorly drained. Runoff is slow on Spurger soils and very slow on Mollville soils. Permeability is slow, and the available water capacity is high. The Spurger soils have a perched water table at a depth of 2.5 to 3.5 feet during winter. The Mollville soils are ponded as much as 0.5 foot during winter and spring and have a perched water table above a depth of 1 foot most other times.

Areas of these soils are used mainly as woodland. The potential productivity is very high for pine trees on Spurger soils and is medium for pine and hardwood trees on Mollville soils. Dominant trees are loblolly pine, shortleaf pine, southern red oak, and sweetgum. Some clear-cut areas are planted to slash pine. The main limitation is the wetness of Mollville soils. Use of harvesting equipment is restricted because of seasonal wetness. Harvesting operations are best done during dry periods.

These soils have medium potential for the production of understory plants that can be grazed by livestock and game animals. Wetness and an increased hardwood overstory reduce the production of forage plants. Major understory plants are pinehill bluestem, switchgrass, yaupon, low panicum, splitbeard bluestem, longleaf uniola, sedges, waxmyrtle, Carolina jessamine, and blackgum.

Some areas of these soils are used as pasture. The potential for pasture and hayland plants is high on Spurger soils and medium on Mollville soils. The main limitation is wetness of the Mollville soils. Proper fertilization, liming, and grazing management are necessary for best production of improved bermudagrass and bahiagrass, crimson clover, arrowleaf clover, and vetch.

The potential is medium for urban uses of Spurger soils. Mollville soils are not suited to urban uses. The main limitations are wetness and the shrinking and swelling of the soil with changes in moisture content. Low strength is a limitation for local roads and streets.

The Spurger soils are in capability subclass IIIe and woodland ordination group 1w2. The Mollville soils are in capability subclass IVw and woodland ordination group 3w9.

STE—Stringtown-Bonwier association, hilly. These deep, loamy soils are on ridgetops and side slopes of uplands. Slopes range from 5 to 20 percent. Soil areas are mostly long and narrow, but some areas are irregular in shape. Soil areas range from 50 to 440 acres.

This association is 40 to 45 percent Stringtown soils, 30 to 35 percent Bonwier soils, and 20 to 30 percent other soils. These percentages were determined by taking samples from random transects made across mapped areas.

Stringtown soils are on convex middle and upper side slopes. Bonwier soils are on the crests and tops of ridges. Other soils in this association are Pinetucky soils on ridges and Urland and Rogan soils mostly on the upper side slopes.

Typically, the surface layer of Stringtown soils is fine sandy loam about 11 inches thick. It is dark grayish brown in the upper part and light yellowish brown in the lower part. The subsoil extends to a depth of 54 inches. To a depth of 26 inches it is strong brown sandy clay loam that has common ironstone pebbles. To a depth of 54 inches the subsoil is sandy clay loam that is reddish yellow in the upper part and mottled with reds, yellows, and grays in the lower part. The underlying material to a depth of 80 inches is stratified light gray, reddish yellow, and red sandy clay loam, shale, and soft sandstone. The soil is strongly acid in the upper part and grades to extremely acid in the lower part.

Typically, the surface layer of Bonwier soils is strongly acid fine sandy loam about 8 inches thick. It is dark grayish brown in the upper part and yellowish brown in the lower part. The next layer to a depth of 36 inches is very strongly acid, red clay. The underlying material to a depth of 60 inches is very strongly acid, stratified light gray, dusky red, and brownish yellow clay, shale, and soft sandstone.

These soils are well drained. Runoff is rapid. Permeability of the Stringtown soils is moderate, and the available water capacity is high. Permeability of the Bonwier soils is moderately slow, and the available water capacity is medium.

Areas of these soils are used mainly as woodland. The potential productivity for pine and hardwood trees is medium on Stringtown soils and low on Bonwier soils. Dominant trees are loblolly pine, shortleaf pine, and mixed hardwoods. The main limitation is the clayey subsoil. There is a hazard of erosion if the surface is left unprotected.

The potential for the production of understory plants that can be grazed by livestock and game animals is medium for Stringtown soils and very high for Bonwier soils. Plant competition reduces the production of forage plants on Stringtown soils. Major understory plants on these soils are pinehill bluestem, pineywoods dropseed, sedges, slender bluestem, American beautyberry, waxmyrtle, and yaupon.

Some areas of these soils are used as pasture. The potential for pasture and hayland plants is medium. The main limitation is the dense, clayey subsoil. Proper fertilization, liming, and grazing management are necessary for best production of improved bermudagrass and bahiagrass, crimson clover, arrowleaf clover, and vetch.

The potential is low for urban uses of these soils. The main limitation is slope. Low strength is a limitation for local roads and streets.

These soils are in capability subclass VIe. The Stringtown soil is in woodland ordination group 3o7, and the Bonwier soil is in woodland ordination group 4c2.

SXC—Stringtown-Bonwier association, graded. These deep, gently sloping and sloping, loamy soils are on ridgetops and side slopes on uplands. The soils have had their upper layers, to a depth of about 12 to 18 inches, removed for construction material. Slopes range from 1 to 8 percent. Soil areas are mostly long and narrow and range from 10 to 28 acres.

This association is 40 to 50 percent Stringtown soils, 20 to 35 percent Bonwier soils, and 20 to 30 percent other soils. These percentages were determined by taking samples from random transects made across mapped areas.

Stringtown soils are on convex upper and middle side slopes of ridges. Bonwier soils are on crests and tops of ridges. Other soils in this association are small areas of Pinetucky soils on ridges and Urland and Rogan soils mostly on the upper side slopes and ridges.

This description is of an undisturbed area of Stringtown soils. In most places in this association, the surface layer and part of the subsoil have been removed. Typically, the surface layer is brownish fine sandy loam about 11 inches thick. The subsoil extends to a depth of 54 inches. To a depth of 26 inches it is strong brown sandy clay loam that has about 10 percent by volume ironstone pebbles. The subsoil to a depth of 54 inches is sandy clay loam that is reddish yellow in the upper part and mottled with reds, yellows, and grays in the lower part. The underlying material to a depth of 80 inches is stratified light gray, reddish yellow, and red sandy clay loam, shale, and soft sandstone. The soil is strongly acid in the upper part and grades to extremely acid in the lower part.

This description is of an undisturbed area of Bonwier soils. In most places in the association, the surface layer and the upper part of the subsoil have been removed. Typically, the surface layer is strongly acid fine sandy loam about 8 inches thick. It is dark grayish brown in the upper part and brown in the lower part. The subsoil to a depth of 36 inches is very strongly acid, red clay. The underlying material to a depth of 60 inches is very strongly acid, stratified light gray, dusky red, and reddish yellow clay, shale, and soft sandstone.

These soils are well drained. Runoff is medium or rapid. Permeability of the Stringtown soils is moderate, and available water capacity is high. Permeability of the Bonwier soils is moderately slow, and available water capacity is medium.

Areas of these soils are used mainly as woodland. Dominant trees are loblolly pine and shortleaf pine. Because the upper soil layers have been removed, exposing the sandy clay loam and clay subsoil, the potential productivity for pine trees is low, and the mortality of pine seedlings is high.

These soils have very low potential for the production of understory plants that can be grazed by livestock and game animals. The droughty, infertile, exposed loamy and clayey subsoil reduces the production of forage plants. Major understory plants are splitbeard bluestem, pinehill bluestem, low panicum, huckleberry, slender bluestem, sedges, greenbrier, and yaupon.

Some areas of these soils are used as pasture. The potential for pasture and hayland plants is low. The main limitation is low fertility, because of the loss of the surface layer. Proper fertilization, liming, and grazing management are necessary for best production of improved bermudagrass and bahiagrass, crimson clover, arrowleaf clover, and vetch.

The potential for urban uses is medium for Stringtown soils and low for Bonwier soils. The main limitation is the shrinking and swelling of the soil with changes in moisture content. Low strength is a limitation for local roads and streets.

These soils are in capability subclass VIe and woodland ordination group 4c2.

TaB—Tahoula clay, 1 to 5 percent slopes. This deep, gently sloping, clayey soil is on broad ridges and mid and upper side slopes on uplands. Soil areas are mostly oblong to irregular in shape and range from 16 to 77 acres.

Typically, this soil has a surface layer about 13 inches thick of moderately alkaline clay that is black in the upper part and dark grayish brown in the lower part. The layer from 13 to 42 inches is moderately alkaline, calcareous, olive gray and olive clay. The underlying material to a depth of 65 inches is moderately alkaline, calcareous, olive clay.

Tahoula soil is somewhat poorly drained. Runoff is slow or medium, and permeability is very slow. The available water capacity is high. A perched water table is commonly above a depth of 2 feet during winter and early in spring.

Included with this soil in mapping are areas of Corrigan, Rayburn, and Browndell soils. These soils are on landscape positions similar to those of the Tahoula soil and have a loamy surface layer. The included soils make up 5 to 10 percent of a mapped area.

Areas of this Tahoula soil are used mainly as woodland. The potential productivity for pine is low. The dominant trees are loblolly, shortleaf, and longleaf pines. Some areas are planted to slash pine. The main limitation is the dense clayey texture throughout the soil. There is a high rate of pine seedling mortality because of the dense, clayey surface layer. Seasonal wetness hinders harvesting operations.

This soil has very high potential for the production of understory plants that can be grazed by livestock and game animals. Major understory plants are pinehill bluestem, splitbeard bluestem, sedges, slender bluestem, switchgrass, brownseed paspalum, and waxmyrtle.

Some areas of this Tahoula soil are used as pasture. The potential for pasture and hayland plants is high. The main limitation is the dense, clayey texture throughout the soil. Proper fertilization and grazing management are necessary for best production of improved bahiagrass, improved bermudagrass, crimson clover, arrowleaf clover, and white clover.

The potential is low or urban uses of this soil. The main limitations are wetness and the shrinking and swelling of the soil with changes in moisture content. Low strength is a limitation for local roads and streets.

This Tahoula soil is in capability subclass IVe and woodland ordination group 4c2.

TaD—Tahoula clay, 5 to 15 percent slopes. These deep, sloping to moderately steep, clayey soils are on narrow ridges and side slopes on uplands. Soil areas are irregular in shape and range from 15 to 115 acres.

Typically, the surface layer is medium acid, black clay about 8 inches thick. The next layer to a depth of 42 inches is medium acid and slightly acid, grayish brown clay. To a depth of 65 inches the soil is moderately alkaline, calcareous, pale olive silty clay.

This Tahoula soil is somewhat poorly drained. Runoff is medium to rapid, and permeability is very slow. The available water capacity is high. These soils commonly have a perched water table above a depth of 2 feet during the winter and spring.

Included with this soil in mapping are areas of Corrigan, Kisatchie, Rayburn, and Browndell soils. Corrigan, Kisatchie, and Rayburn soils are mostly on lower side slopes. Some areas are on ridgetops. Browndell soils are mostly on middle slopes. The included soils make up 10 to 15 percent of any mapped area.

Areas of this Tahoula soil are used mainly as woodland. The potential productivity for pine trees is low. Dominant trees are loblolly, shortleaf, and longleaf pines. The main limitation is the dense, clayey soil texture, which causes a high rate of pine seedling mortality. Seasonal wetness hinders harvesting operations.

This soil has very high potential for the production of understory plants that can be grazed by livestock and game animals. Major understory plants are pinehill bluestem, splitbeard bluestem, sedges, slender bluestem, switchgrass, brownseed paspalum, and waxmyrtle.

Some areas of this Tahoula soil are used as pasture. The potential for pasture and hayland plants is medium. The main limitation is the dense, clayey soil texture. Proper fertilization and grazing management are necessary for best production of improved bahiagrass, improved bermudagrass, crimson clover, arrowleaf clover, and white clover.

The potential is low for urban uses of this soil. The main limitations are the shrinking and swelling of the soil with changes in moisture content, slope, and wetness. Low strength is a limitation for local roads and streets.

This Tahoula soil is in capability subclass VIe and woodland ordination group 4c2.

TLE—Tehran-Letney association, hilly. These deep, sandy soils are on ridgetops and side slopes above drainageways on uplands. Slopes range from 8 to 20 percent. Soil areas are irregular in shape and range from 40 to 1,000 acres.

This association is 45 to 60 percent Tehran soils, 25 to 35 percent Letney soils, and 15 to 20 percent other soils. These percentages were determined by taking samples from random transects made across mapped areas.

Tehran soils are mostly on the concave, lower slopes. Letney soils are mostly on ridges and convex, upper side slopes. Other soils of this association are small areas of Doucette and Boykin soils on upper side slopes and ridgetops, Stringtown and Bonwier soils on ridgetops, and Melhomes soils on the lower slopes and in drainageways.

Typically, the surface layer of Tehran soils is strongly acid, loamy sand about 13 inches thick. It is dark grayish brown in the upper part and brown in the lower part. The next layer to a depth of 51 inches is strongly acid and very strongly acid, light yellowish brown sand. The subsoil to a depth of 75 inches is very strongly acid sandy clay loam that is reddish yellow in the upper part and mottled in shades of brown, red, and gray in the lower part.

Typically, the surface layer of Letney soils is very strongly acid, dark grayish brown loamy sand about 7 inches thick. The next layer to a depth of 34 inches is very strongly acid, pale brown loamy sand. The subsoil to a depth of 75 inches is very strongly acid sandy clay loam that is strong brown in the upper part and reddish yellow in the lower part.

Tehran soils are somewhat excessively drained, and Letney soils are well drained. Permeability of Tehran and Letney soils is moderately rapid. Runoff is slow. The available water capacity is low for Tehran soils and medium for Letney soils.

Areas of this association are used mainly as woodland. The potential productivity for pine trees is medium. Dominant trees are loblolly, shortleaf, and longleaf pines. Some clear-cut areas are planted to slash pine. The main limitation for growing pines is the seedling mortality caused by droughtiness.

These soils have medium potential for the production of understory plants that can be grazed by livestock and game animals. Droughtiness and low fertility reduce the production of forage plants. Major understory plants are pinehill bluestem, low panicum, longleaf uniola, splitbeard bluestem, tickclover, and threeawns.

The potential for pasture and hayland plants is low. The main limitation is the droughty, sandy surface layer. Proper fertilization, liming, and grazing management are necessary for best production of improved bermudagrass, bahiagrass, and vetch.

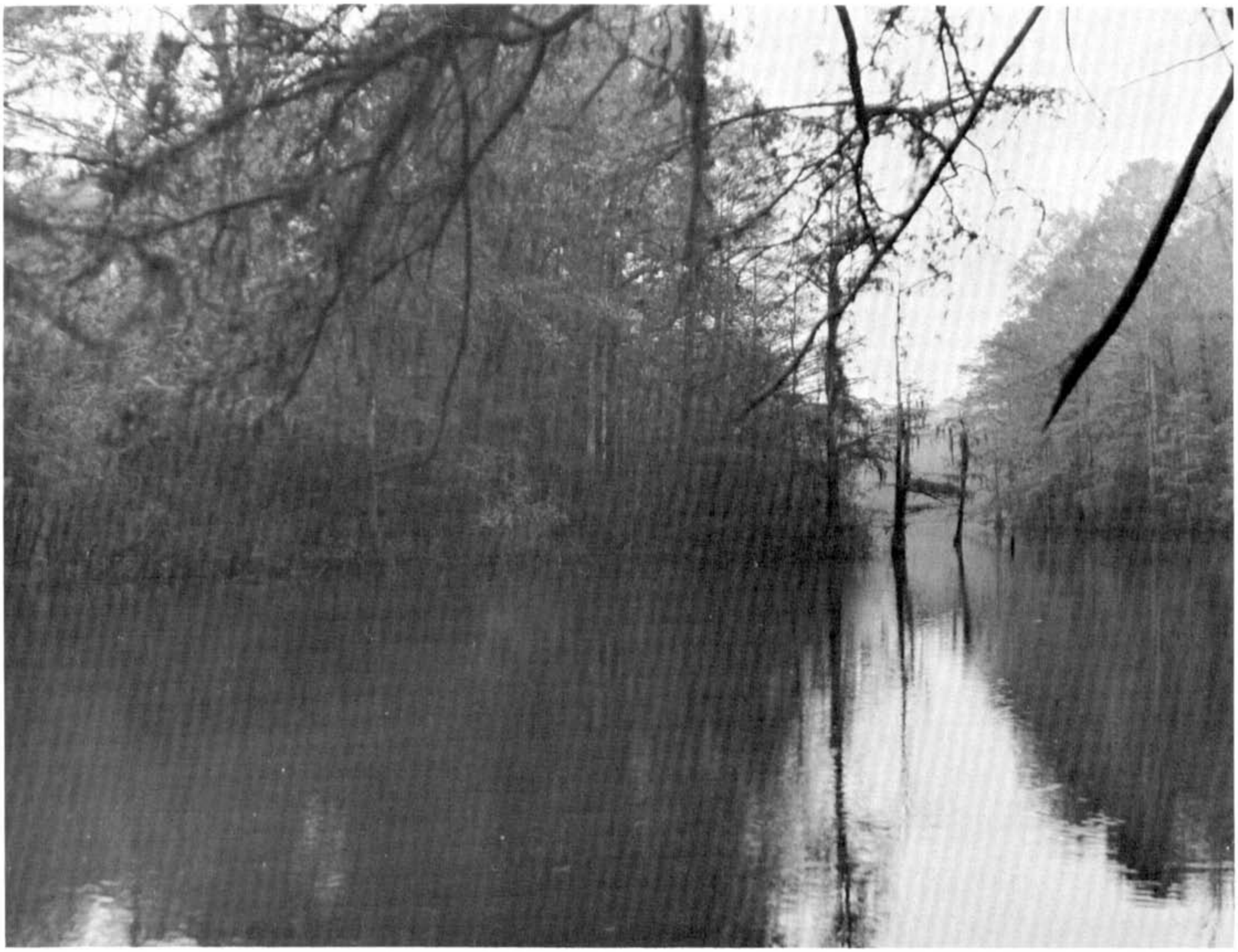


Figure 11.—A slough in an area of Urbo and Mantachie soils, frequently flooded. Sloughs are excellent overwintering areas for waterfowl and provide good fishing.

The potential is low for most urban uses of these soils. The main limitations are slope, sandy texture, and seepage.

The soils are in capability subclass VIe. The Tehran soils are in woodland ordination group 3s3, and the Letney soils are in woodland ordination group 2s3.

Um—Urbo and Mantachie soils, frequently flooded. These deep, clayey and loamy soils are on broad bottom lands on the flood plains of major rivers and along the larger streams. The areas are cut by old stream channels and sloughs (fig. 11). These soils are flooded at least once in two years. Slopes range from 0 to 3 percent. Soil areas are broad and in a continuum along the drainageways. Mapped areas range from 100 to several thousand acres.

This undifferentiated group is 50 to 75 percent Urbo soils, 20 to 40 percent Mantachie soils, and 10 to 15 percent other soils. These percentages were determined by taking samples from random transects made across mapped areas.

Urbo soils are on broad, nearly level areas. Mantachie soils are on slightly higher positions, and mapped areas are generally long and narrow. Other soils in the map unit are Iuka and Mooreville soils on slightly higher positions; Bleakwood soils on similar positions as the Urbo and Mantachie soils; long, narrow areas of Ochlockonee soils, mostly beside the stream and river banks; and Bienville and Alaga soils on narrow and high ridges, mostly along the edges of mapped areas.

Typically, the surface layer of Urbo soils is slightly acid, very dark grayish brown clay about 4 inches thick. The subsoil extends to a depth of 65 inches or more. To a depth of 52 inches it is very strongly acid, grayish brown clay that has brownish mottles. To a depth of 65 inches it is very strongly acid, light brownish gray clay that has reddish mottles.

Typically, the surface layer of Mantachie soils is strongly acid, brown loam about 8 inches thick. The subsoil extends to a depth 72 inches or more. To a depth of 14 inches it is strongly acid, mottled brown, grayish brown, and yellowish brown loam. To a depth of 72 inches it is very strongly acid, light brownish gray clay loam that grades to light gray clay loam in the lower part.

The Urbo and Mantachie soils are somewhat poorly drained. Runoff is slow. Permeability of the Urbo soils is very slow, and permeability of the Mantachie soils is moderate. The available water capacity is high. The soils are flooded at least once in two years. During the winter and spring in most years, there is a high water table at a depth of 1 foot to 2 feet in the Urbo soils and at a depth of 1 foot to 1.5 feet in the Mantachie soils.

Areas of these soils are used mainly as woodland. The potential productivity for hardwood trees is very high. Dominant trees are water oak and sweetgum. Some areas are planted to loblolly pine and slash pine. Because of wetness and flooding, harvesting can be done only during prolonged dry periods.

The potential for the production of understory plants that can be grazed by livestock and game animals is very low for Urbo soils and medium for Mantachie soils. Wetness and a thick canopy of hardwood trees reduce the production of forage plants. Major understory plants are low panicum, pinehill bluestem, splitbeard bluestem, sedges, greenbrier, and waxmyrtle.

These soils can be used as pasture. The potential for pasture and hayland plants is medium on Urbo soils and high on Mantachie soils. The main limitation is wetness. Proper fertilization, liming, and grazing management are necessary for best production of improved bermudagrass and bahiagrass, white clover, and singletary peas.

These soils are not suited to urban uses because of flooding and wetness.

These soils are in capability subclass Vw and woodland ordination group 1w6.

UPB—Urland-Pinetucky association, undulating. These deep, loamy soils are on broad ridges and mid to upper side slopes on uplands. Slopes range from 1 to 8 percent. Soil areas are oblong to irregular in shape and range from 35 to about 150 acres.

This association is 55 to 70 percent Urland soils, 15 to 25 percent Pinetucky soils, and 15 to 20 percent other soils. These percentages were determined by taking samples from random transects made across mapped areas.

Urland soils are mostly on slightly convex crests and upper side slopes of ridges. Pinetucky soils are mostly on the mid and lower slopes. Other soils in this association are Newco and Bonwier soils on similar positions as the Urland soils, and Stringtown soils on ridges.

Typically, the surface layer of Urland soils is medium acid fine sandy loam about 10 inches thick. It is dark grayish brown in the upper part and yellowish brown in the lower part. The upper part of the subsoil to a depth of 24 inches is strongly acid, red clay. The lower part of the subsoil to a depth of 48 inches is very strongly acid, yellowish red clay loam. The underlying material to a depth of 65 inches is very strongly acid, yellow, white, and pink stratified clay loam, clay, and sandstone.

Typically, the surface layer of Pinetucky soils is medium acid fine sandy loam about 14 inches thick. It is dark grayish brown in the upper part and light yellowish brown in the lower part. The upper part of the subsoil to a depth of 54 inches is strongly acid, strong brown sandy clay loam. The lower part of the subsoil to a depth of 72 inches is very strongly acid, yellowish brown sandy clay loam. The lower part of the subsoil is about 8 percent plinthite.

Urland soils are well drained, and Pinetucky soils are moderately well drained. Runoff is medium, and permeability is moderately slow. The available water capacity is medium for Urland soils and high for Pinetucky soils.

Areas of these soils are used mainly as woodland. The potential productivity for pine trees is high. Dominant trees are loblolly pine and shortleaf pine. Some areas are planted to slash pine. The main limitation is the dense, clayey subsoil of the Urland soils.

These soils have low potential for the production of understory plants that can be grazed by livestock and game animals. Plant competition and rapid changes in canopies reduce production of forage plants. Major understory plants on these soils are pinehill bluestem, slender bluestem, pineywoods dropseed, Carolina jessamine, greenbrier, American beautyberry, and yaupon.

The potential for pasture and hayland plants is very high. Proper fertilization, liming, and grazing management are necessary for best production of improved bermudagrass and bahiagrass, crimson clover, arrowleaf clover, and white clover.

The potential is medium for most urban uses of these soils. Limitations are the shrinking and swelling of the soil with changes in moisture content and slope in some places. Low strength is a limitation for local roads and streets.

The Urland soils are in capability subclass IVe, and the Pinetucky soils are in capability subclass IIIe. The Urland

and Pinetucky soils are in woodland ordination group 2o1.

WAA—Waller-Evadale association, nearly level. These deep, loamy soils are on depressional areas and drainageways of the uplands and terraces. Slopes range from 0 to 1 percent. Soil areas are long and broad along drainageways and irregular to oblong in shape in other areas. Soil areas range from 40 to 760 acres.

This association is 60 to 80 percent Waller soils, 15 to 40 percent Evadale soils, and 0 to 10 percent other soils. These percentages were determined by taking samples from random transects made across mapped areas.

Waller soils are on low, broad, plane areas. Evadale soils are mostly on broad areas and are slightly higher than Waller soils. Other soils in this association are small areas of Gist and Vidrine soils on mounds.

Typically, the surface layer of Waller soils is strongly acid very fine sandy loam about 6 inches thick. It is dark grayish brown in the upper part and grayish brown in the lower part. The next layer to a depth of 16 inches is strongly acid, light brownish gray very fine sandy loam. The upper part of the subsoil to a depth of 36 inches is very strongly acid, light brownish gray sandy clay loam that has pockets and streaks of gray very fine sandy loam. The lower part of the subsoil to a depth of 64 inches is very strongly acid, gray clay loam that has pockets and streaks of dark grayish brown loam and brownish and yellowish mottles.

Typically, the surface layer of Evadale soils is very strongly acid, dark grayish brown silt loam about 3 inches thick. To a depth of 17 inches it is very strongly acid, light brownish gray silt loam. The upper part of the subsoil to a depth of 50 inches is very strongly acid, gray clay that has pockets and streaks of silt loam. The lower part of the subsoil to a depth of 72 inches is strongly acid very dark grayish brown clay.

These soils are poorly drained. Runoff is slow. Permeability of the Waller soils is moderate, and permeability of the Evadale soils is very slow. The available water capacity is high. These soils are commonly saturated during the winter and spring. The water table is commonly above a depth of 2.5 feet in the Waller soils. The Evadale soils have a perched water table above a depth of 1.5 feet.

Areas of these soils are used mainly as woodland. The potential productivity for pine and hardwood trees is high on Waller soils and very high on Evadale soils. Dominant trees are loblolly pine, shortleaf pine, longleaf pine, water oak, and sweetgum. Many areas are planted to slash pine. The main limitation is wetness, which restricts harvesting operations to prolonged dry periods. Pine seedling mortality is a concern on the Waller soils because of prolonged wetness.

These soils have medium potential for the production of understory plants that can be grazed by livestock and game animals. Plant competition, wetness, and hardwoods in the canopy reduce the production of forage plants. Major understory plants are pinehill bluestem, low panicum, greenbrier, longleaf uniola, sedges, Carolina jessamine, beaked panicum, spreading panicum, and waxmyrtle.

The potential for pasture and hayland plants is medium on Waller soils and low on Evadale soils. The main limitation is wetness. Proper fertilization, liming, and grazing management are necessary for best production of improved bermudagrass and bahiagrass, white clover, hop clover, and singletary peas.

The potential for urban uses is very low for Waller soils and low for Evadale soils. The main limitation is wetness.

The Waller soils are in capability subclass Vlw and woodland ordination group 2w9. The Evadale soils are in capability subclass IIIw and woodland ordination group 1w9.

WgC—Wiergate clay, 1 to 8 percent slopes. These deep, gently sloping and sloping, clayey soils are on mid to lower side slopes on uplands (fig. 12). Soil areas are generally irregular in shape and range from 35 to 650 acres.

Typically, the surface layer is slightly acid, black clay about 21 inches thick. To a depth of 27 inches the soil is moderately alkaline, calcareous, pale olive clay. To a depth of 75 inches the soil is moderately alkaline, calcareous, gray clay that has many slickensides and is mottled in the lower part.

This Wiergate soil is somewhat poorly drained. Runoff is slow or medium. Permeability is very slow. The available water capacity is high. The upper layers are saturated during the winter and early in spring by a perched water table above a depth of 2 feet.

Included with this soil in mapping are areas of Burkeville, Woodville, and Redco soils. Burkeville and Redco soils are on similar positions as the Wiergate soil. Woodville soils are on ridges and upper side slopes. These included soils make up 5 to 10 percent of any mapped area.

Areas of this Wiergate soil are used mainly as woodland and pasture. The potential productivity for pine and hardwood trees is high. The dominant trees are loblolly pine, shortleaf pine, and sweetgum. Some old fields are planted to slash pine. The main limitation is the dense, clayey soil texture. The dense, clayey surface layer causes a high rate of pine seedling mortality. Seasonal wetness hampers harvesting operations.

These soils have high potential for the production of understory plants that can be grazed by livestock and game animals. Plant competition and an increased overstory canopy reduce the production of forage plants. Major understory plants are longleaf uniola, waxmyrtle, pinehill bluestem, slender bluestem, pineywoods dropseed, Carolina jessamine, and sedges.

The potential for pasture and hayland plants is medium. The main limitation is the dense, clayey soil layers. Proper fertilization and grazing management are necessary for best production of improved bermudagrass and bahiagrass, arrowleaf clover, and white clover.

The potential is low for urban uses of this soil. The main limitations for urban uses are wetness and the shrinking and swelling of the soil with changes in moisture content. Low strength is a limitation for local roads and streets.

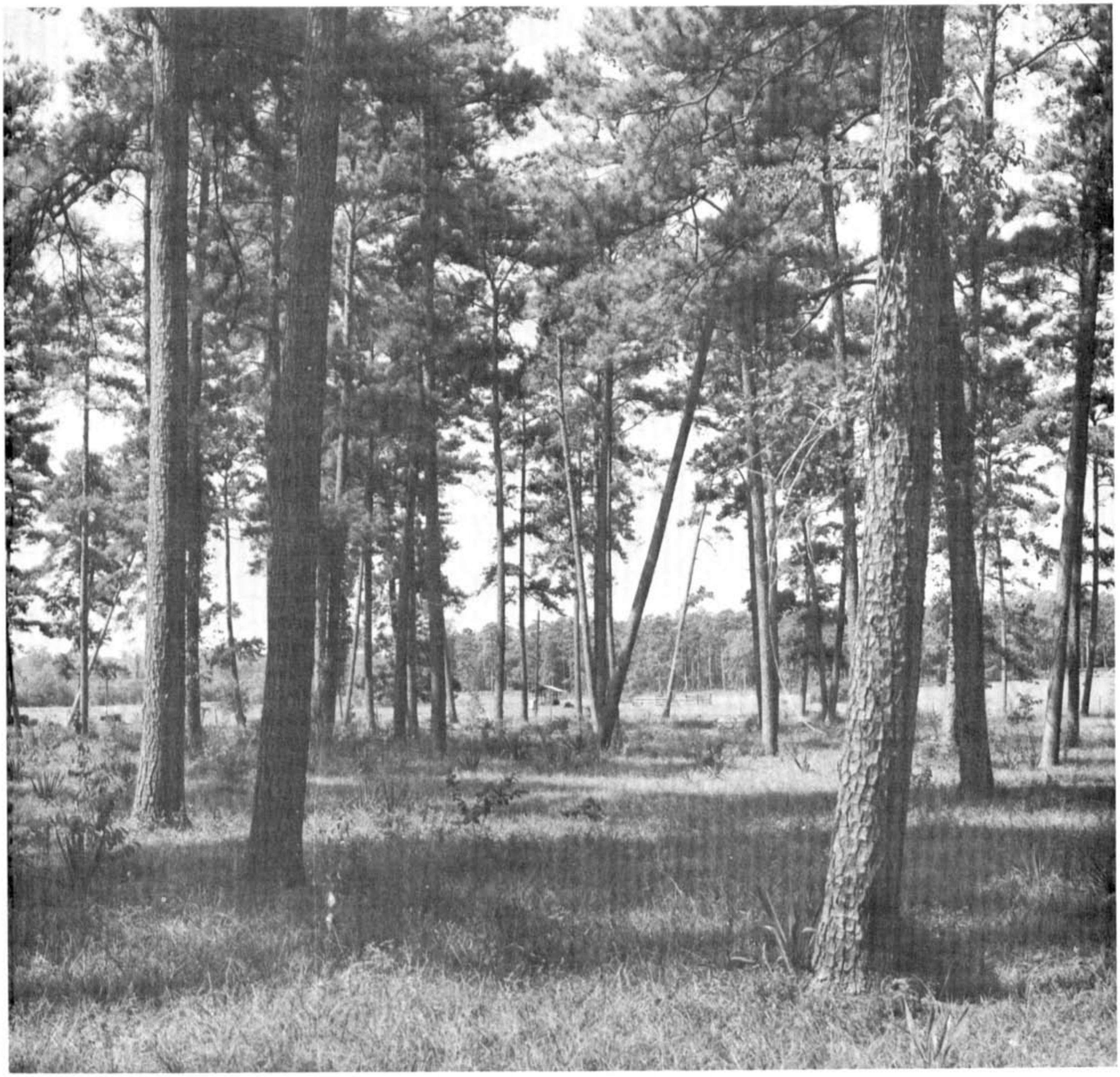


Figure 12.—An area of Wiergate clay, 1 to 8 percent slopes. The shrink-swell properties of this soil cause the trees to lean.

This Wiergate soil is in capability subclass VIe and woodland ordination group 2c8.

WTB—Woodville-Redco association, gently undulating. These deep, loamy and clayey soils are on broad ridges and side slopes on uplands. Slopes range from 0 to 5 percent. Soil areas are oblong to irregular in shape and range from 40 to nearly 920 acres.

This association is 70 to 80 percent Woodville soils, 5 to 15 percent Redco soils, and 5 to 15 percent other soils. These percentages were determined by taking samples from random transects made across mapped areas.

Woodville soils are mostly on broad ridgetops and side slopes. Redco soils are mostly on the slightly concave, lower side slopes and on the less sloping parts of the broad ridges. Other soils in this association are Wiergate soils on lower side slopes, Pinetucky soils on ridgetops, and a soil that is similar to Woodville soils but has gray colors throughout on the lower side slopes and in seepy areas and drainageways.

Typically, the surface layer of Woodville soils is strongly acid fine sandy loam about 9 inches thick. It is dark grayish brown in the upper part and pale brown in the lower part. The subsoil extends to a depth of 65 inches or more. It is very strongly acid, dark red clay to a depth of 20 inches; very strongly acid, mottled red and gray clay to a depth of 45 inches; and very strongly acid, light gray clay to a depth of 65 inches.

Redco soils have gilgai microrelief. It is 8 to 15 feet between the center of a microknoll and a microdepression, and the highs are 4 to 12 inches above the lows. Typically, the surface layer is very strongly acid, dark brown clay about 5 inches thick. To a depth of 72 inches the soil is very strongly acid clay that is yellowish brown in the upper part, light brownish gray in the middle part, and gray in the lower part. Mottles in shades of red, gray, brown, and yellow are throughout.

Woodville soils are moderately well drained, and Redco soils are somewhat poorly drained. Runoff is very slow to medium. Permeability is very slow. The available water capacity is high. The Woodville soils have a high water table at a depth of 2.5 to 4 feet during the winter and spring in most years, and the Redco soils have a high water table above a depth of 2 feet during the fall, winter, and spring.

Areas of these soils are used mainly as woodland and pasture. The potential productivity for pine and hardwood trees is high on Woodville soils and medium on Redco soils. Dominant trees are loblolly pine, shortleaf pine, and mixed hardwoods. The main limitation is the dense, clayey subsoil. Harvesting operations are restricted to periods when the soils are not wet.

The potential for the production of understory plants that can be grazed by livestock and game animals is high for Woodville soils and very high for Redco soils. Plant competition and an increased overstory canopy reduce the production of forage plants on Woodville soils. Major understory plants are longleaf uniola, waxmyrtle, pinehill bluestem, slender bluestem, pineywoods dropseed, and sedges.

The potential for pasture and hayland plants is high on Woodville soils and medium on Redco soils. The main limitation is the dense, clayey subsoil. Proper fertilization, liming, and grazing management are necessary for best production of improved bermudagrass and bahiagrass, crimson clover, and arrowleaf clover.

The potential is low for urban uses of these soils. The main limitation is the shrinking and swelling of the soil with changes in moisture content. Low strength is a limitation for local roads and streets.

These soils are in capability subclass IVe. The Woodville soils are in woodland ordination group 2c8, and the Redco soils are in woodland ordination group 3c8.

prime farmland soils

Prime farmland soils, as defined by the U.S. Department of Agriculture, are soils that are best suited to producing food, feed, forage, fiber, and oilseed crops. They have adequate soil quality, growing season, and moisture supply to economically produce a sustained high yield of crops if acceptable farming methods are used. Prime farmland soils produce the highest yields with minimal inputs of energy and money, and farming them results in the least damage to the environment. Prime farmland soils are of major importance in satisfying the Nation's short- and long-range needs for food and fiber. The supply of high quality farmland is limited, and the U.S. Department of Agriculture recognizes that all levels of government, as well as groups and individuals, must encourage and facilitate the use of prime farmland soils with wisdom and foresight.

Prime farmland soils may now be in crops, pasture, woodland, or other land uses, but not urban and built-up land or water areas. They must be used for producing food or fiber or be available for these uses.

Prime farmland soils generally have an adequate and dependable supply of moisture from precipitation or irrigation. They have favorable temperature and growing season and acceptable soil reaction. They have few or no rocks and are permeable to water and air. Prime farmland soils are not excessively erodible or saturated with water for long periods and are not flooded during the growing season. Slope ranges mainly from 0 to 5 percent. For more detailed information on the criteria for prime farmland soils, consult the local staff of the Soil Conservation Service.

Areas of prime farmland soils are scattered throughout the survey area, but general soil map units 1, 4, 6, and 10 have the largest areas of prime farmland soils. Most areas are in woodland. A few areas are in pasture and miscellaneous uses.

A recent trend in land use in some parts of the county has resulted in the loss of some prime farmland soils to urban and industrial uses. The loss of prime farmland soils to other uses puts pressure on marginal lands, which generally are more erodible, droughty, difficult to cultivate, and less productive.

The soil map units that are prime farmland soils in Jasper and Newton Counties are listed in this section. This list does not constitute a recommendation for a particular land use. The extent of each listed map unit is shown in table 4. The location is shown on the detailed soil maps in the back of this publication. The soil qualities that affect use and management are described in the section "Detailed soil map units."

Soils that have limitations, such as a high water table or flooding, may qualify as prime farmland soils if these limitations are overcome by such measures as drainage or flood control. In the following list, the needed corrective measure, if any, is noted after the map unit name. Onsite evaluation is necessary to see if corrective measures have been effective.

The soil map units in this list are prime farmland soils except where they are used as urban or built-up land. Urban and built-up land is any contiguous area of 10 acres or more that is used for residences, industrial sites, commercial sites, construction sites, institutional sites, public administrative sites, railroad yards, small parks, cemeteries, airports, golf courses, sanitary landfills, sewage treatment plants, water control structures and spillways, shooting ranges, and other similar uses. Some of the soil map units are prime farmland soils only if the indicated corrective measure has been taken.

AtA—Attoyac fine sandy loam, 0 to 3 percent slopes
BaB—Bernaldo-Besner complex, gently undulating
GAB—Gallime-Spurger association, gently undulating
KWB—Kirbyville-Waller association, gently undulating (where sufficiently drained)
MaB—Malbis fine sandy loam, 1 to 5 percent slopes
MKB—Malbis-Kirbyville association, gently undulating
Mr—Mooreville soils, occasionally flooded
NEB—Newco-Urland association, gently undulating
NKB—Niwana-Kirbyville association, gently undulating
Oc—Ochlockonee soils, occasionally flooded
RPB—Rogan-Pinetucky association, gently undulating
SMB—Spurger-Mollville association, gently undulating (where sufficiently drained)

use and management of the soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavior characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as rangeland and woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreation facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

crops and pasture

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under "Detailed soil map units." Specific information can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

crops

Cropland is of minor extent and importance in Jasper and Newton Counties. Most areas are along roads and near homesites. The areas are used as gardens and for growing truck crops and livestock feed. The truck crops are corn, oats, soybeans, tomatoes, watermelons, and pears. Corn is the main crop for livestock feed.

The soils are managed mainly to control water erosion, maintain tilth and fertility, and, in some cases, drain off excess water. The major practices used to accomplish these purposes are—

- *using crop residue*—Leaving crop residue on the soil helps to control water erosion and conserve moisture. Incorporating residue into the soil helps to improve tilth and the available water capacity.
- *farming on the contour*—Terracing and farming on the contour help to control water erosion. This is beneficial on most soils that have slopes of more than 1 percent.
- *using cover crops*—Cover crops furnish protective cover after the crop has been harvested and before the next cultivated crop is planted. Some cover crops suitable for most of the soils in the survey area are small grain, vetch, and mixtures of annual grasses and legumes.
- *maintaining fertility*—Most crops respond well to commercial fertilizer. Where the proper amounts and kinds of fertilizer are applied and proper management is used, soil fertility levels can be maintained.

Information on these soil management practices can be obtained at the local office of the Soil Conservation Service.

pasture

Claude K. Compton, agronomist, Soil Conservation Service, helped to prepare this section.

Because the raising of livestock is one of the main farming enterprises in Jasper and Newton Counties, pasture and hay are important. The more important grasses grown are common bermudagrass, coastal bermudagrass, improved bermudagrass, bahiagrass, and weeping lovegrass. Crimson clover, white clover,

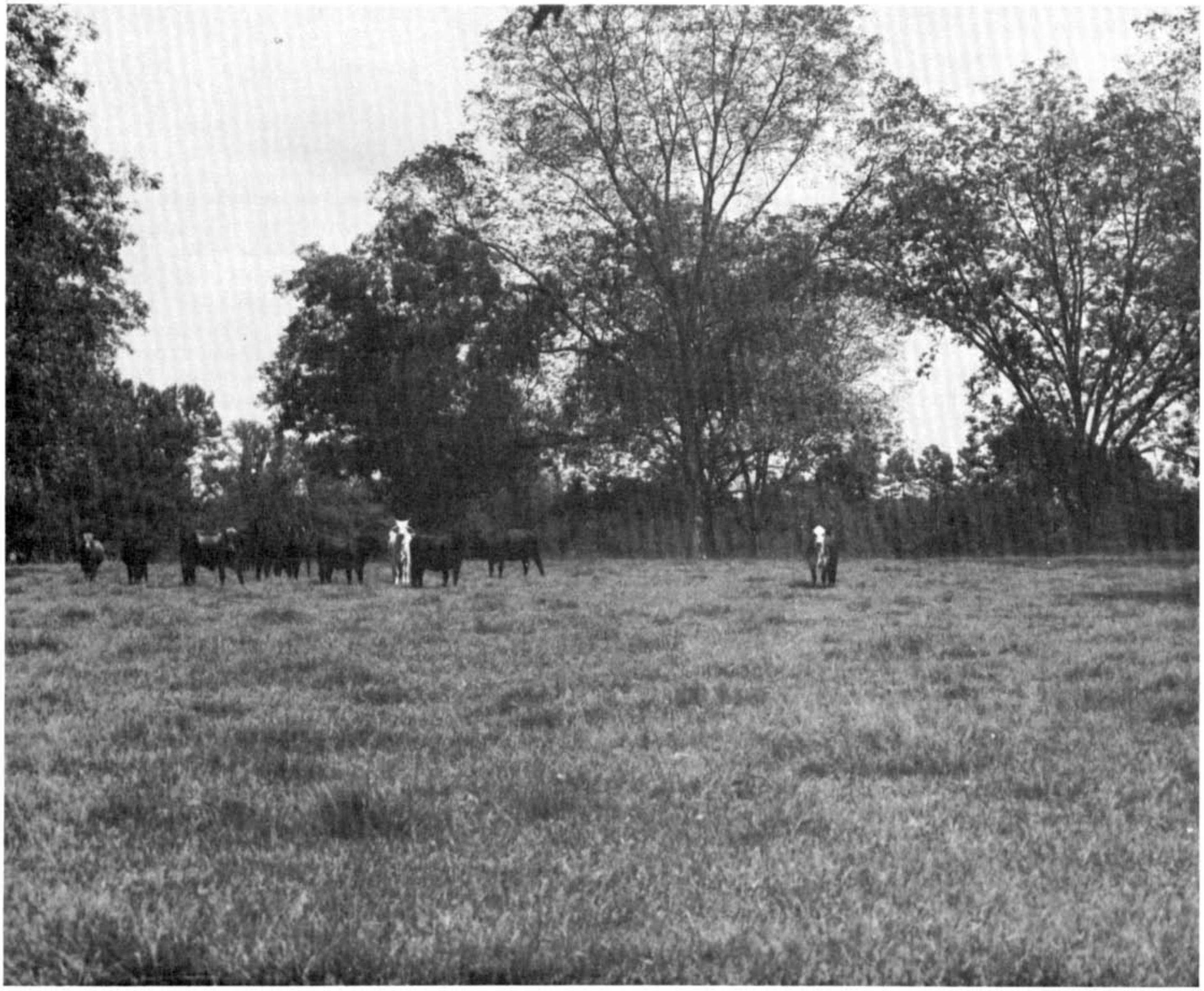


Figure 13.—Coastal bermudagrass in an area of Malbis fine sandy loam, 1 to 5 percent slopes, has high grazing value for cattle. Tame pasture requires such management practices as grazing control, fertilization, and weed and brush control.

arrowleaf clover, vetch, and singletary peas are some of the main legumes planted with perennial grasses.

Most improved pastures are areas of old cropland that were converted to grasses. An improved pasture or meadow is one in which grasses are introduced to obtain higher production of forage crops.

Tame pastures require grazing control, weed and brush control, fertilization, and other appropriate management practices (fig. 13).

All of the soils in Jasper and Newton Counties need fertilization for high production of good quality forage. Most of the soils also need lime. Many of the soils on bottom lands and in wet areas on uplands need some improvement in surface drainage before high production can be attained.

yields per acre

The average yields per acre that can be expected of the principal pasture plants under a high level of management are shown in table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various grasses and legumes depends on the kind of soil and the plant. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each grass or legume; effective use of crop residue, barnyard manure, and green-manure crops; and harvesting that insures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal grasses or legumes. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

The local office of the Soil Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of soils.

land capability classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor does it consider possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for woodland, and for engineering purposes.

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit. Only class and subclass are used in this survey. These levels are defined in the following paragraphs.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have slight limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c,* used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w, s,* or *c* because the soils in class V are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation.

The acreage of soils in each capability class and subclass is shown, by county, in table 6. The capability classification of each map unit is given in the section "Detailed soil map units."

woodland management and productivity

Robert A. Blackbourn, forester, Soil Conservation Service, helped to prepare this section.

The soils of the survey area are primarily forest land. About 88 percent of the total area is commercial forest. Of the 1,086,400 acres of commercial forest land, 73 percent is owned by the forest industry, 24 percent is owned by private individuals, 2 percent is National Forest, and 1 percent is in other public ownership. Of the acres of commercial forest land, 39 percent is the loblolly pine—shortleaf pine forest cover type, 10 percent is longleaf pine-slash pine, 25 percent is oak-pine, 14 percent is oak-hickory, and 12 percent is oak-gum-cypress (*6*).

Extensive timber cutting is done in the survey area. Many understocked and economically mature stands are being clearcut, site prepared, and machine planted to seedlings. The Texas Forest Service recently reported that nearly 10 percent of the southern pine seedlings sold by the service in East Texas for the 1978 planting season were planted in Jasper and Newton Counties. Also, some timber companies have nurseries that supply trees to landowners in the survey area.

Commercial thinning has been an important management practice. An increasing amount is being done in plantations.

Table 7 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination (woodland suitability) symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for important trees. The number 1 indicates very high productivity; 2, high; 3, medium; 4, low; and 5, very low. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *x* indicates stoniness or rockiness; *w*, excessive water in or on the soil; *t*, toxic substances in the soil; *d*, restricted root depth; *c*, clay in the upper part of the soil; *s*, sandy texture; *f*, high content of coarse fragments in the soil profile; and *r*, steep slopes. The letter *o* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: x, w, t, d, c, s, f, and r. The third part of the symbol, a number, is local in nature and refers to varying degrees of limitations and kinds of trees that are suitable.

In table 7, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Ratings of the *erosion hazard* indicate the risk of loss of soil in well managed woodland. The risk is *slight* if the expected soil loss is small, *moderate* if measures are needed to control erosion during logging and road construction, and *severe* if intensive management or special equipment and methods are needed to prevent excessive loss of soil.

Ratings of *equipment limitation* reflect the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. A rating of *slight* indicates that use of equipment is not limited to a particular kind of equipment or time of year, and that seasonal wetness is not a concern; *moderate* indicates a short seasonal limitation or a need for some modification in management or in equipment because of seasonal wetness lasting up to 3 months; and *severe* indicates a seasonal limitation, a need for special equipment or management, or a hazard in the use of equipment.

Seedling mortality ratings indicate the degree to which the soil affects the mortality of tree seedlings. Plant competition is not considered in the ratings. The ratings apply to seedlings from good stock that are properly planted during a period of sufficient rainfall. A rating of *slight* indicates that the expected mortality is less than 25 percent; *moderate*, 25 to 50 percent; and *severe*, more than 50 percent.

Ratings of *windthrow hazard* are based on soil characteristics that affect the development of tree roots and the ability of the soil to hold trees firmly. A rating of *slight* indicates that a few trees may be blown down by normal winds; *moderate*, that some trees will be blown down during periods of excessive soil wetness and strong winds; and *severe*, that many trees are blown down during periods of excessive soil wetness and moderate or strong winds.

Ratings of *plant competition* indicate the degree to which undesirable plants are expected to invade where there are openings in the tree canopy. The invading plants compete with native plants or planted seedlings. A rating of *slight* indicates little or no competition from other plants; *moderate* indicates that plant competition is expected to hinder the development of a fully stocked stand of desirable trees; *severe* indicates that plant competition is expected to prevent the establishment of a desirable stand unless the site is intensively prepared, weeded, or otherwise managed to control undesirable plants.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index*. This index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index was calculated age 50 for all tree species. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

Trees to plant are those that are suited to the soils and to commercial wood production.

woodland understory vegetation

Claude Compton, agronomist, Soil Conservation Service, helped to prepare this section.

Livestock farming is an important enterprise in Jasper and Newton Counties. According to statistics of the Texas Crop and Reporting Service, about 21,000 cattle were in the survey area in 1978. The cattle operations are mainly cow-calf. The major source of forage for the cattle is improved pastures, but many farmers have woodlands that contribute significantly to the total forage consumed by livestock. Some lease woodland for grazing from timber companies. More than 100,000 acres of commercial forest in the survey area is grazed by domestic livestock.

Forage production is greatest following clearcutting of pines. Herbage yields average about 1,500 pounds (air-dry) per acre annually, and on choice sites can exceed

3,000 pounds. On grazed range that is periodically burned, grasses comprise at least 80 percent of the vegetation; sedges, rushes, forbs, and shrubs make up the rest.

On understory vegetation that is grazed throughout the year, cattle eat mostly grass. In Louisiana studies, the diet of breeding herds averaged 91 percent grass, 4 percent grasslike plants, 4 percent forbs, and 1 percent browse (*9*). Browsing was mainly in winter, when green grass was scarce.

Changing canopies of overstory pines and hardwoods and understory shrubs decrease the yield of forage within 4-1/2 feet of the ground. Thinning, controlled burning, and livestock grazing management are necessary to maintain moderate and good production.

If pine stands are control-burned regularly and grazed moderately, the proportion of grasses, sedges, forbs, and shrubs is similar to that on cutover lands. Most pine forests can provide forage in usable quantities for livestock. Without grazing and fire, shrubs and scrub hardwoods drastically reduce forage production to the point where it is of little value to cattle.

Understory vegetation consists of grasses, forbs, shrubs, and other plants. Some woodland, if well managed, can produce enough understory vegetation to support grazing of livestock or wildlife, or both, without damage to the trees.

The quantity and quality of understory vegetation vary with the kind of soil, the age and kind of trees in the canopy, the density of the canopy, and the depth and condition of the litter. The density of the canopy determines the amount of light that understory plants receive.

Table 8 shows, for each soil suitable for woodland use, the potential for producing understory vegetation. The total production of understory vegetation includes the herbaceous plants and the leaves, twigs, and fruit of woody plants up to a height of 4-1/2 feet. It is expressed in pounds per acre of air-dry vegetation in favorable, normal, and unfavorable years. In a favorable year, soil moisture is above average during the optimum part of the growing season; in a normal year, soil moisture is average; and in an unfavorable year, it is below average.

Table 8 also lists the common names of the characteristic vegetation on each soil and the percentage composition, by air-dry weight, of each kind of plant. The table shows the kind and percentage of understory plants expected under a canopy density that is most nearly typical of woodland in which the production of wood crops is highest.

There are several practices designed to help the land user achieve high levels of forage production consistent with good forest management. These practices are briefly described in the following paragraphs.

Proper grazing is grazing at an intensity that maintains or improves the quantity and quality of desirable plants. This is generally thought to be grazing of no more than one-half, by weight, of the annual growth of key forage plants in preferred grazing areas. This increases vigor and reproduction of these key forage plants, conserves soil and water, improves the condition of the vegetation, increases forage production, maintains natural beauty, and reduces the hazard of wildfire.

Deferred grazing consists of postponing grazing or resting the site from grazing for a prescribed period. This rest period promotes the growth of natural vegetation by increasing the vigor of forage and permitting desirable plants to seed. This provides feed reserves for fall and winter grazing, improves the appearance of lands that have adequate cover, improves hydrologic conditions, and reduces soil loss.

Planned grazing is a system in which two or more grazing units are rested from grazing in a planned sequence throughout the year or during the growing season of key forage plants. This is advantageous for the production of desirable forage plants as well as for trees.

Prescribed burning involves the use of controlled fire. This can be used to control undesirable vegetation; remove old, unpalatable, rough growth; improve palatability and quality of forage; and increase production.

recreation

The soils of the survey area are rated in table 9 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewerlines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 9, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 9 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 12 and interpretations for dwellings without basements and for local roads and streets in table 11.

Camp areas require site preparation such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking, horseback riding, and bicycling should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

wildlife habitat

Frank Sprague, biologist, Soil Conservation Service, helped to prepare this section.

Jasper and Newton Counties are rural environments dominated by stands of pines and mixed hardwoods on uplands and stands of hardwoods adjacent to rivers and streams on bottom lands.

Habitat for the many species of wildlife is provided by a diverse mixture of trees, shrubs, and herbaceous plants. Interspersed within the woodlands are openings that have been cleared and established to pastureland or planted to crops.

The major game species are white-tailed deer, fox and gray squirrels, turkey, bobwhite quail, and mourning dove. Important furbearers are raccoon, mink, fox, opossum, skunk, and beaver. Waterfowl are common on ponds, streams, and flooded bottom lands during the fall and winter. Numerous nongame birds and animals are associated with various habitat types. The edge effect provided by timber harvest is valuable to this nongame wildlife as well as to quail and rabbit.

Black bear and red wolf were formerly found in the county, but they have not been seen in recent years. The bald eagle, American alligator, and red-cockaded woodpecker are endangered species that occur in these counties.

White-tailed deer populations have increased in Jasper and Newton Counties during the past few years. This is because of increased landowner interest in habitat management and protection. Populations average about one deer to 75 acres but are higher in many areas. Leasing by hunting clubs is increasing. This provides an economic incentive for management. The lack of reliable year-round food supplies limits the number of deer that can be supported by many tracts of land, particularly tracts where pine production is the dominant land use.

Squirrel populations are high and are associated primarily with hardwood trees along rivers and streams. Populations fluctuate according to food supplies. Destruction of hardwoods is the greatest threat to squirrels.

The eastern turkey has been reestablished in East Texas. Its numbers are increasing where the turkey is protected and where its habitat needs are met. A hunting season for turkey has been established in a portion of Newton County.

Quail habitat requirements are provided in clearcuts, weedy pasture, and small cropland fields. Disking to promote forb growth is beneficial for quail.

Timber management practices that include wildlife considerations offer the best opportunities for improving wildlife habitat. Increased application of prescribed burning would benefit deer and other species.

Upland soils are well adapted to a variety of plants useful to wildlife. Corn, oats, peas, and other food and forage plants can be planted and raised successfully. Bottom land soils are generally fine textured and allow the construction of dikes for green tree reservoirs or other wetland development.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 10, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, Pensacola bahiagrass, arrowleaf clover, and singletary peas.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are wooly croton, ragweed, partridge pea, and St. Andrews cross.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, the available water capacity, and wetness. Examples of these plants are oak, blackgum, cherry, sweetgum, hawthorn, dogwood, and hickory. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are plum, autumn-olive, and crabapple.

Coniferous plants furnish browse, seeds, and cones. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine and eastern redcedar.

Shrubs are bushy woody plants that produce fruit, buds, twigs, bark, and foliage. Soil properties and features that affect the growth of shrubs are depth of the root zone, available water capacity, salinity, and soil moisture. Examples of shrubs are yaupon, American beautyberry, and American holly.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, slope, and surface stoniness. Examples of wetland plants are smartweed and Japanese millet.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The wildlife attracted to these areas include bobwhite quail, dove, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, woodcock, woodpeckers, squirrels, raccoon, and deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, shore birds, nutria, mink, and beaver.

engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. The ratings are given in the following tables: Building site development, Sanitary facilities, Construction materials, and Water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations need to be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to (1) evaluate the potential of areas for residential, commercial, industrial, and recreation uses; (2) make preliminary estimates of construction conditions; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; (5) plan detailed onsite investigations of soils and geology; (6) locate potential sources of gravel, sand, earthfill, and topsoil; (7) plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and (8) predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey can be used to make additional interpretations.

Some of the terms used have a special meaning in soil science and are defined in the Glossary.

building site development

Table 11 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell potential, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 to 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material, a base of gravel, crushed rock, or stabilized soil material, and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, and depth to a high water table affect the traffic supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

sanitary facilities

Table 12 shows the degree and the kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 12 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to effectively filter the effluent. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 12 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage due to rapid permeability of the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground water pollution. Ease of excavation and revegetation needs to be considered.

The ratings in table 12 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area type sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

construction materials

Table 13 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a probable or improbable source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet, and the depth to the water table is less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 13, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

water management

Table 14 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and potential frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to reduce erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts or sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

soil properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics. These results are reported in table 18.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classifications, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

engineering index properties

Table 15 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Soil series and their morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If a soil contains particles coarser than sand, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (*2*) and the system adopted by the American Association of State Highway and Transportation Officials (*1*).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as Pt. Soils exhibiting engineering properties of two groups can have a dual classification, for example, SP-SM.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in table 18.

Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an oven-dry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

physical and chemical properties

Table 16 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, and plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earth-moving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3 bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69. The higher the value the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Organic matter is the plant and animal residue in the soil at various stages of decomposition.

In table 16, the estimated content of organic matter of the plow layer is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter of a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

soil and water features

Table 17 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Flooding, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt and water in swamps and marshes are not considered flooding.

Table 17 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, common, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *common* that it is likely under normal conditions; *occasional* that it occurs on an average of once or less in 2 years; and *frequent* that it occurs on an average of more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; November-May, for example, means that flooding can occur during the period November through May.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons that form in soils that are not subject to flooding.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 17 are the depth to the seasonal high water table; the kind of water table—that is, perched, artesian, or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 17.

An apparent water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. An artesian water table is under hydrostatic head, generally beneath an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole. A perched water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Only saturated zones within a depth of about 6 feet are indicated. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The first numeral in the range indicates how high the water rises above the surface. The second numeral indicates the depth below the surface.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is specified as either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

engineering index test data

Table 18 shows laboratory test data for several pedons sampled at carefully selected sites in the survey area. The pedons are typical of the series and are described in the section "Soil series and their morphology." The soil samples were tested by the Texas State Department of Highways and Public Transportation.

The testing methods generally are those of the American Association of State Highway and Transportation Officials (AASHTO) or the American Society for Testing and Materials (ASTM).

The tests and methods are: AASHTO classification—M 145 (AASHTO), D 3282 (ASTM); Unified classification—D 2487 (ASTM); Mechanical analysis—T 88 (AASHTO), D 2217 (ASTM); Liquid limit—T 89 (AASHTO), D 423 (ASTM); Plasticity index—T 90 (AASHTO), D 424 (ASTM); Specific gravity (Particle index)—T 100.

classification of the soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*14*). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. In table 19, the soils of the survey area are classified according to the system. The categories are defined in the following paragraphs.

ORDER. Ten soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Ultisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aqualf (*Aqu*, meaning water, plus *alf*, from Alfisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Fluvaquents (*Fluv*, meaning flood plain, plus *aquent*, the suborder of the Entisols that have an aquic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Hapludults.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is clayey, mixed, thermic Typic Hapludults.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

soil series and their morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the Soil Survey Manual (*13*). Many of the technical terms used in the descriptions are defined in Soil Taxonomy (*14*). Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed soil map units."

Alaga series

The Alaga series consists of deep, gently undulating, sandy, somewhat excessively drained, rapidly permeable soils on terraces along rivers and major streams. These soils formed in thick fluvial beds of sands and loamy sands. Slope ranges from 1 to 5 percent.

A typical pedon of Alaga loamy sand, in an area of Bienville-Alaga association, gently undulating, in Newton County; from the intersection of Texas Highway 87 and Farm Road 2829 near Old Salem, 0.5 mile southeast along Farm Road 2829, 1.4 miles east along an oilfield road, and 100 feet north, in forest:

A1—0 to 5 inches; dark grayish brown (10YR 4/2) loamy sand; weak granular structure; very friable, soft; common medium and fine roots and few coarse roots; strongly acid; clear smooth boundary.

C1—5 to 32 inches; yellowish brown (10YR 5/6) loamy sand; few medium pale brown (10YR 6/3) mottles; weak coarse prismatic structure; loose, very friable; few fine and medium roots; strongly acid; diffuse smooth boundary.

C2—32 to 65 inches; brownish yellow (10YR 6/6) loamy sand; few medium pale brown (10YR 6/3) mottles; single grained; loose, very friable; few fine and medium roots; strongly acid; diffuse smooth boundary.

C3—65 to 80 inches; light yellowish brown (10YR 6/4) and light gray (10YR 7/1) sand; common medium brownish yellow (10YR 6/6, 6/8) mottles; single grained; loose, very friable; strongly acid.

The sandy sediment is more than 80 inches thick.

The A horizon ranges from 4 to 10 inches in thickness. It is sand, fine sand, loamy sand, or loamy fine sand. The A horizon is grayish brown, dark grayish brown, very dark grayish brown, dark brown, and brown. Reaction ranges from medium acid to very strongly acid.

The C horizon is yellowish brown, brownish yellow, light brown, brown, pale brown, light yellowish brown, and strong brown. The lower part of the C horizon has mottles of pale brown, brown, and dark brown. The C horizon is loamy sand and loamy fine sand. Strata of sand or fine sand are common below a depth of 50 inches. Reaction ranges from medium acid to very strongly acid.

Attoyac series

The Attoyac series consists of deep, nearly level, loamy, well drained, moderately permeable soils on stream terraces. The soils formed in loamy, old alluvial deposits. Slope ranges from 0 to 3 percent.

A typical pedon of Attoyac fine sandy loam, 0 to 3 percent slopes, in Jasper County; from the intersection of Farm Roads 1013 and 1005 at Mount Union, 0.6 mile west on Farm Road 1013, 0.4 mile north along a county road, and 150 feet east, in forest:

A11—0 to 5 inches; brown (7.5YR 5/4) fine sandy loam; weak fine granular structure; slightly hard, friable; many fine and medium roots; common wormcasts; strongly acid; clear smooth boundary.

A12—5 to 11 inches; yellowish brown (10YR 5/4) fine sandy loam; weak fine granular structure; slightly hard, friable; many fine and medium roots; common wormcasts; strongly acid; clear smooth boundary.

B21t—11 to 20 inches; yellowish red (5YR 4/6) sandy clay loam; weak medium and fine subangular blocky structure; slightly hard, friable; common fine and medium roots; many fine pores; common wormcasts; patchy clay films; strongly acid; gradual smooth boundary.

B22t—20 to 42 inches; red (2.5YR 4/6) sandy clay loam; moderate medium subangular blocky structure; hard, friable; few fine roots; few fine pores; few wormcasts; patchy clay films; strongly acid.

B23t—42 to 54 inches; red (2.5YR 5/8) sandy clay loam; moderate medium subangular blocky structure; hard, friable; few patchy clay films; strongly acid; diffuse smooth boundary.

B24t—54 to 72 inches; yellowish red (5YR 5/8) sandy clay loam; weak medium subangular blocky structure; slightly hard, friable; few patchy clay films; strongly acid.

The solum ranges from 60 to more than 80 inches in thickness.

The A horizon is reddish brown, brown, strong brown, yellowish brown, or dark brown. Where moist value is less than 3.5 and chroma is 3 or less, the horizon is less than 6 inches thick. The A horizon is fine sandy loam or sandy loam. It ranges from strongly acid to slightly acid.

The upper part of the Bt horizon is dark red, red, or yellowish red. It is sandy clay loam, loam, or fine sandy loam. The average clay content in the upper 20 inches of the Bt horizon ranges from 18 to 32 percent, and the silt content exceeds 20 percent. The lower part of the Bt horizon is red, dark red, yellowish red, or strong brown. It is sandy clay loam or loam. The Bt horizon ranges from strongly acid to slightly acid. Few pockets and streaks of uncoated sand and silt are in some pedons, but they make up less than 5 percent by volume.

Bernaldo series

The Bernaldo series consists of deep, gently undulating, loamy, well drained, moderately permeable soils on stream terraces. These soils formed in loamy, old alluvial deposits. Slope is 0 to 3 percent.

A typical pedon of Bernaldo loam, in an area of Bernaldo-Besner complex, gently undulating, in Jasper County; from Magnolia Springs, 4.0 miles northwest and north along a county road to its intersection with Tom Thomas Road, 100 feet west and 120 feet north of the intersection, in forest in an intermound area:

A1—0 to 3 inches; dark grayish brown (10YR 4/2) loam; few medium faint brown (10YR 5/3) mottles; weak fine granular structure; slightly hard, friable; common fine and medium roots and few coarse roots; strongly acid; clear smooth boundary.

A2—3 to 8 inches; yellowish brown (10YR 5/4) loam; few stains of brown (10YR 5/3); weak fine subangular blocky structure; slightly hard, friable; common fine and medium roots; strongly acid; clear smooth boundary.

B21t—8 to 15 inches; yellowish brown (10YR 5/6) sandy clay loam; weak medium subangular blocky structure; slightly hard, friable; common fine roots and few medium and coarse roots; very strongly acid; clear smooth boundary.

B22t—15 to 28 inches; strong brown (7.5YR 5/6) sandy clay loam; many medium distinct yellowish red (5YR 4/6) mottles and few medium prominent red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; hard, friable; few fine and medium roots; strongly acid; gradual smooth boundary.

B23t—28 to 43 inches; brownish yellow (10YR 6/6) sandy clay loam; moderate medium subangular structure; slightly hard, friable; strongly acid; diffuse smooth boundary.

B24t&A'2—43 to 75 inches; brownish yellow (10YR 6/6) sandy clay loam; about 8 percent interfingering of light brownish gray (10YR 6/2) loam; few medium prominent red (2.5YR 4/6) and yellowish red (5YR 4/6) mottles; weak medium subangular blocky structure; slightly hard, friable; 7 percent by volume brittle masses; strongly acid.

The solum ranges from 60 to more than 80 inches in thickness.

The A horizon ranges from 8 to 16 inches in thickness. The A1 horizon is dark brown, very dark grayish brown, brown, pale brown, dark grayish brown, or grayish brown. The A2 horizon is brown, grayish brown, yellowish brown, or pale brown. The A horizon is fine sandy loam or loam. Reaction ranges from slightly acid to strongly acid.

The B2t horizon is strong brown, brown, yellowish brown, light yellowish brown, or brownish yellow. The B2t horizon is mainly sandy clay loam, but it ranges to loam and clay loam. Mottles of red, brown, and gray are in most pedons. The B2t horizon ranges from slightly acid to very strongly acid.

The B2t&A'2 horizon has a range in color similar to that of the B2t horizon. Interfingering and tongues of A2 material make up 5 to 15 percent of the horizon. The B2t&A'2 horizon is fine sandy loam, loam, or sandy clay loam. Brittle masses make up as much as 10 percent of the horizon in some pedons.

Besner series

The Besner series consists of deep, gently undulating, loamy, well drained, moderately permeable soils on terraces. These soils formed in loamy sediment that has been modified by wind. Slope ranges from 0 to 3 percent.

A typical pedon of Besner fine sandy loam, in an area of Bernaldo-Besner complex, gently undulating, in Jasper County; from Magnolia Springs, northwest and north 4.0 miles along a county road to its intersection with Tom Thomas Road, 100 feet west and 115 feet north of the intersection, in forest on a mound:

A1—0 to 4 inches; grayish brown (10YR 5/2) fine sandy loam; weak medium granular and weak fine blocky structure; soft, very friable; common fine roots and few medium and coarse roots; strongly acid; clear smooth boundary.

A2—4 to 22 inches; pale brown (10YR 6/3) fine sandy loam; weak medium granular and weak fine blocky structure; soft, very friable; common fine roots and few medium and coarse roots; strongly acid; gradual smooth boundary.

B21t—22 to 34 inches; pale brown (10YR 6/3) and brown (7.5YR 5/4) fine sandy loam; weak medium granular and weak fine blocky structure; soft, very friable; few brittle masses; common fine roots and few medium and coarse roots; very strongly acid; clear smooth boundary.

B22t&A2—34 to 37 inches; brown (7.5YR 5/4) fine sandy loam; weak medium granular and weak fine blocky structure; soft, very friable; about 18 percent of the horizon is pale brown (10YR 6/3) interfingers 1 to 3 millimeters wide; strongly acid; clear smooth boundary.

B23t—37 to 48 inches; strong brown (7.5YR 5/6) sandy clay loam; weak medium subangular blocky structure; hard, friable; strongly acid; diffuse smooth boundary.

B24t—48 to 70 inches; yellowish brown (10YR 5/8) sandy clay loam; few medium prominent red (2.5YR 4/6) mottles; weak medium subangular blocky structure; hard, friable; strongly acid.

The solum ranges from 60 to more than 80 inches in thickness.

The A horizon is 20 to 35 inches thick. The A1 horizon is grayish brown, dark grayish brown, or brown. The A2 horizon is brown, pale brown, or light yellowish brown. The A horizon is mostly fine sandy loam, but it ranges to loam in a few pedons. Reaction is medium acid to very strongly acid.

The Bt&A2 horizon is yellowish brown, light yellowish brown, brownish yellow, pale brown, brown, strong brown, or reddish yellow. It is mainly loam in the Bt part and fine sandy loam in the A2 part. Interfingers of A2 material make up 10 to 35 percent of the horizon. Reaction is strongly acid or very strongly acid.

The Bt horizon has a range of colors similar to that of the Bt&A2 horizon. In some pedons the Bt horizon is up to 5 percent plinthite. This horizon ranges from loam to sandy clay loam. Brittle masses and bodies make up as much as 20 percent of the lower part of the Bt horizon in some areas. Reaction is strongly acid or very strongly acid.

Bienville series

The Bienville series consists of deep, gently undulating, sandy, somewhat excessively drained soils on terraces near the river bottom lands. Permeability is moderately rapid. These soils formed in sandy alluvium mainly from sandy coastal plain sediment. Slope ranges from 1 to 5 percent.

A typical pedon of Bienville loamy fine sand, in an area of Bienville-Alaga association, gently undulating, in Newton County; from the intersection of U.S. Highway 96 and Farm Road 82 in Kirbyville, 5.5 miles east along Farm Road 82, 4.0 miles south on Texas Highway 87, 2.0 miles southeast on Farm Road 2829 to Old Salem, 2.6 miles south on a county road, 0.6 mile northeast along a forest road to a fork in the road, and 50 feet west of the road:

A1—0 to 6 inches; brown (10YR 4/3) loamy fine sand; weak fine granular structure; soft, very friable; many fine and medium roots; medium acid; clear smooth boundary.

A2—6 to 20 inches; brown (7.5YR 5/4) loamy fine sand; common medium distinct light yellowish brown (10YR 6/4) mottles; coarse prismatic structure parting to weak medium subangular blocky; soft, very friable; few fine and medium roots; strongly acid; gradual wavy boundary.

B21t&A2—20 to 70 inches; strong brown (7.5YR 5/6) loamy fine sand; many medium and coarse distinct light gray (10YR 7/1) spots and streaks of uncoated sand grains; coarse prismatic structure parting to weak medium subangular blocky; soft, very friable; few fine and medium roots in the upper part; very strongly acid; diffuse irregular boundary.

A'2&B22t—70 to 80 inches; pale brown (10YR 6/3) loamy fine sand; many medium and coarse distinct strong brown (7.5YR 5/6) mottles; single grained; loose, very friable; very strongly acid.

The solum ranges from 60 to more than 80 inches in thickness.

The A horizon ranges from 20 to 40 inches in thickness. The A horizon is mainly loamy fine sand, but it ranges to fine sand. The A1 horizon is dark grayish brown or brown. The A2 horizon is brown, yellowish brown, or pale brown. The A horizon is medium acid or strongly acid.

The Bt horizon is brown, strong brown, yellowish brown, or pale brown. Bodies of uncoated sand grains, or A2 material, have similar colors. The A2 material makes up from 20 to about 45 percent of the horizon. The horizon is mainly loamy fine sand, but it ranges to fine sandy loam and fine sand in the lower part. Reaction is strongly acid or very strongly acid.

Bleakwood series

The Bleakwood series consists of deep, nearly level, loamy, poorly drained, moderately permeable soils on bottom lands. These soils formed in loamy alluvial sediment. Slope ranges from 0 to 2 percent.

A typical pedon of Bleakwood fine sandy loam, in an area of Mantachie and Bleakwood soils, frequently flooded, in Jasper County; from the intersection of U.S. Highway 190 and U.S. Highway 96 in Jasper, 10.4 miles south on U.S. Highway 96 to its intersection with Farm Road 2245, 1.1 miles northeast on Farm Road 2245, and 150 feet south, in forest. The site is about 50 feet west of Everett Creek:

A1—0 to 3 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; slightly hard, friable, nonsticky and nonplastic; common fine roots; slightly acid; clear smooth boundary.

B21g—3 to 12 inches; light brownish gray (10YR 6/2) loam; common medium distinct brownish yellow (10YR 6/6) mottles and few fine distinct strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; very strongly acid; gradual wavy boundary.

B22g—12 to 30 inches; light brownish gray (10YR 6/2) loam; many fine and medium distinct strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; very strongly acid; gradual wavy boundary.

B23g—30 to 45 inches; light brownish gray (10YR 6/2) loam; common medium distinct strong brown (7.5YR 5/6) mottles and few fine faint brownish yellow (10YR 6/6) mottles; weak medium subangular blocky structure; friable, slightly plastic; few fine roots; very strongly acid; gradual wavy boundary.

B24g—45 to 72 inches; light brownish gray (10YR 6/2) clay loam; common medium distinct strong brown (7.5YR 5/6) mottles and few fine faint brownish yellow (10YR 6/6) mottles; weak medium subangular blocky structure; friable, slightly sticky; very strongly acid.

The solum ranges from 40 to more than 60 inches in thickness. Reaction is strongly acid or very strongly acid except in the surface layer.

The A1 horizon is dark grayish brown, brown, dark yellowish brown, or grayish brown. It is loam, silt loam, or fine sandy loam. Reaction ranges from slightly acid to very strongly acid.

The B2g horizon is dark gray, dark grayish brown, grayish brown, gray, light brownish gray, or light gray.

Mottles range from few to many in shades of yellow and brown. The B2g horizon is fine sandy loam, loam, or clay loam. The weighted average clay content of the 10- to 40-inch control section ranges from 18 to 35 percent; the control section contains more than 15 percent sand that is coarser than very fine sand. A stratified or massive C horizon that has colors and textures similar to those of the B horizon is in some pedons.

Bonwier series

The Bonwier series consists of moderately deep, gently sloping to hilly, loamy, well drained soils on uplands. Permeability is moderately slow. These soils formed in stratified, loamy and clayey coastal plain sediment. Slope ranges from 1 to 20 percent.

A typical pedon of Bonwier fine sandy loam, in an area of Bonwier-Stringtown association, hilly, in Newton County; from Newton, 4.1 miles northeast on Texas Highway 87, 5.0 miles east on Farm Road 1414, 1.5 miles northwest on a county road, 0.6 mile south on a forest road, and 50 feet east, in a pine plantation:

A1—0 to 5 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak medium granular structure; slightly hard, very friable; about 5 percent ironstone pebbles and fragments; strongly acid; clear smooth boundary.

A2—5 to 9 inches; brown (7.5YR 5/4) fine sandy loam; weak medium granular structure; slightly hard, very friable; about 10 percent ironstone pebbles and fragments; strongly acid; clear smooth boundary.

B2t—9 to 25 inches; red (2.5YR 4/6) clay; common medium distinct reddish yellow (7.5YR 6/8) mottles; strong medium blocky structure; hard, very firm; clay film on ped faces; about 5 percent ironstone fragments and pebbles in the upper part; very strongly acid; gradual smooth boundary.

B3&C—25 to 33 inches; red (2.5YR 4/6) clay; light gray (10YR 7/1) and dark yellowish brown (10YR 4/4) shale fragments; moderate medium blocky structure; hard, very firm; peds coated with clay films; very strongly acid; clear wavy boundary.

C—33 to 60 inches; stratified light gray (10YR 7/1), dusky red (10YR 3/3), red (2.5YR 4/6), and reddish yellow (5YR 6/6) clay and soft sandstone; strata of clay 1/4 inch to 3 inches thick; sandstone is weakly cemented; very strongly acid.

The solum ranges from 20 to 40 inches in thickness. The clay content of the control section ranges from 40 to 60 percent.

The A1 horizon is very dark grayish brown, dark gray, dark grayish brown, or dark brown. The A2 horizon is brown, yellowish brown, or light yellowish brown. Reaction of the A horizon ranges from slightly acid to very strongly acid.

The Bt horizon is dark reddish brown, reddish brown, yellowish red, red, or dark red. Mottles in shades of yellow, brown, gray, and red range from none to common. These mottles are concentrated in the lower part of the Bt horizon. The gray mottles are shale fragments. The Bt horizon is 1 to 10 percent by volume angular ironstone fragments. Reaction is strongly acid or very strongly acid.

The C horizon is stratified beds of clay, shale, and weakly consolidated sandstone. It is gray, brown, and red. Flakes of mica are along cleavage planes between strata in some pedons. Reaction is strongly acid or very strongly acid.

Boykin series

The Boykin series consists of deep, undulating to hilly, sandy, well drained, moderately permeable soils on uplands. These soils formed in sandy and loamy coastal plain sediment of Pleistocene age. Slope ranges from 1 to 20 percent.

A typical pedon of Boykin loamy fine sand, in an area of Doucette-Boykin association, undulating, in Newton County; from the intersection of U.S. Highway 190 and Texas Highway 87 in Newton, 0.7 mile northeast on Texas Highway 87, 0.5 mile north on a county road to a fork, 0.4 mile west on a county road, and 150 feet north, in forest:

A1—0 to 8 inches; brown (10YR 4/3) loamy fine sand; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine and medium roots; few coarse roots; medium acid; clear smooth boundary.

A2—8 to 24 inches; yellowish brown (10YR 5/4) loamy fine sand; massive; loose, very friable, nonsticky and nonplastic; many fine roots and common medium roots; few krotovinas filled with brown loamy fine sand; medium acid; clear smooth boundary.

B21t—24 to 27 inches; yellowish red (5YR 5/6) fine sandy loam; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine and medium roots; medium acid; clear smooth boundary.

B22t—27 to 48 inches; red (2.5YR 5/6) sandy clay loam; moderate medium subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; few thin patchy clay films on faces of peds; few fine and medium roots; strongly acid; gradual smooth boundary.

B23t—48 to 72 inches; yellowish red (5YR 5/8) sandy clay loam; few medium distinct strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few thin patchy clay films on faces of peds; very strongly acid; gradual smooth boundary.

B3—72 to 80 inches; reddish yellow (7.5YR 6/8) sandy clay loam; common medium distinct light gray (10YR 7/1) mottles and few fine distinct yellowish red (5YR 5/6) mottles; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few patches of clay films on vertical faces of peds; very strongly acid.

The solum is more than 60 inches in thickness. Clay content in the upper 20 inches of the argillic horizon ranges from 18 to 30 percent. Base saturation at a depth of 50 inches below the top of the Bt horizon ranges from 5 to 20 percent.

The A horizon ranges from 20 to 40 inches in thickness. Reaction ranges from very strongly acid to slightly acid. The A1 horizon is dark grayish brown or brown. The A2 horizon is light brown, pale brown, yellowish brown, or light yellowish brown.

The Bt horizon is fine sandy loam or sandy clay loam. Reaction ranges from very strongly acid to medium acid. The Bt horizon is red, yellowish red, or strong brown. Mottles in shades of brown, red, and yellow range from few to common. A few plinthite nodules are in the lower part of the solum of some pedons, but they constitute less than 5 percent of any horizon. Some pedons have skeletans that have chroma of 2 or 3 in the lower part of the B horizon.

Browndell series

The Browndell series consists of shallow, sloping, loamy, somewhat poorly drained, very slowly permeable soils on uplands. These soils formed in weakly consolidated, acid, tuffaceous sandstone and siltstone. Slope ranges from 2 to 12 percent.

A typical pedon of Browndell loam, in an area of Browndell-Rock outcrop complex, sloping, in Newton County; from Toledo Bend Dam, south on Farm Road 692 to its intersection with Farm Road 255, 1.2 miles southwest on Farm Road 255, and 200 feet south, in forest:

A1—0 to 4 inches; dark grayish brown (10YR 4/2) loam; weak fine subangular blocky and granular structure; friable, soft; many fine roots; few cobbles and stones; slightly acid; abrupt wavy boundary.

B2t—4 to 11 inches; grayish brown (10YR 5/2) clay; few fine faint pale brown mottles; weak medium subangular blocky structure; very firm, extremely hard, very plastic and sticky; few apparent clay films; common fine roots; strongly acid; clear wavy boundary.

B3—11 to 15 inches; grayish brown (2.5Y 5/2) clay and weakly consolidated volcanic tuff; common fine faint light brownish gray mottles; dark grayish brown (10YR 4/2) stains on faces of peds; moderate medium subangular blocky structure; very firm, slightly hard, very plastic and sticky; tuffaceous material is friable when moist; few roots; few clay films; strongly acid; clear smooth boundary.

Cr—15 to 30 inches; pale olive (5Y 6/3) weakly consolidated tuffaceous siltstone; faces of angular fractures are coated with light olive gray (5Y 6/2); few medium dark grayish brown (10YR 4/2) streaks; massive; hard; hardness is less than 3 on Moh's scale; strongly acid.

The solum thickness and depth to paralithic tuffaceous sandstone and siltstone is 14 to 20 inches. Cobbles and stones 3 to 15 inches or more inches in diameter cover up to 15 percent of the surface of most pedons.

The A horizon is dark gray, dark grayish brown, very dark gray, or very dark grayish brown. It is fine sandy loam or loam. Reaction is very strongly acid to slightly acid. The A horizon of some pedons has gravel-size fragments that comprise up to 10 percent by volume. The boundary between the A1 and B2t horizon is clear or abrupt, smooth or wavy, and has an abrupt textural change.

The B2t horizon is grayish brown, light brownish gray, light olive gray, pale olive, or grayish brown. Mottles are few or common and are pale brown in the upper part of this horizon and brown and light brownish gray in the lower part. The grayish matrix colors are probably inherited from the underlying material. The B2t horizon is clay or silty clay. The clay content averages between 40 to 60 percent. Gravel-size fragments in some pedons range up to 15 percent by volume. The Bt horizon is very strongly acid to medium acid.

The Cr horizon is pale olive, light olive gray, light gray, gray, or light brownish gray. It is weakly consolidated, tuffaceous sandstone and siltstone that is bentonitic but contains volcanic ash, volcanic glass, and other pyroclastic material. The Cr horizon is extremely acid to slightly acid.

Burkeville series

The Burkeville series consists of deep, gently sloping to strongly sloping, clayey, somewhat poorly drained, very slowly permeable soils on uplands. These soils formed in weakly consolidated, calcareous clays and marls of the coastal plain (fig. 14). Slope ranges from 3 to 12 percent.

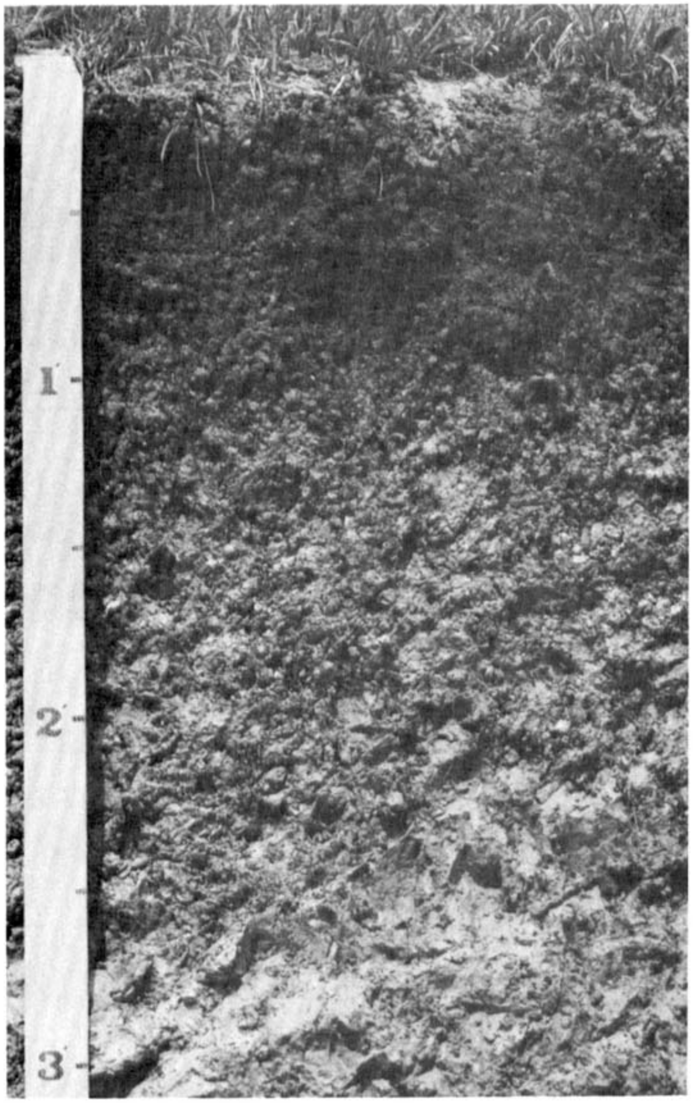


Figure 14.—A profile of Burkeville clay showing slickensides below a depth of 5 inches.

A typical pedon of Burkeville clay, 3 to 12 percent slopes, in Newton County; from the intersection of Texas Highway 63 and Farm Road 692 in Burkeville, 1.0 mile northeast on Farm Road 692, 1,200 feet south on a forest trail, and 100 feet east, in eroded pasture:

Ap—0 to 5 inches; dark gray (5YR 4/1) clay; moderate medium blocky structure; very hard, firm, sticky and plastic; many fine roots; common fine pores; few wormcasts; few concretions of calcium carbonate; few small snail shells; calcareous; moderately alkaline; gradual wavy boundary.

AC1—5 to 18 inches; light olive gray (5Y 6/2) clay; common fine distinct light yellowish brown (2.5YR 6/4) mottles and few fine distinct olive yellow (2.5Y 6/6) mottles; moderate medium blocky structure with wedge-shaped peds; extremely hard, very firm, very sticky and plastic; common fine roots; few fine pores; few large slickensides; common strongly cemented concretions and few soft masses of calcium carbonate; few black concretions; calcareous; moderately alkaline; diffuse wavy boundary.

AC2—18 to 65 inches; light gray (5Y 7/1) clay; moderate medium blocky structure; common medium distinct olive yellow (2.5YR 6/8), light yellowish brown (2.5YR 6/4), and reddish gray (5YR 5/2) mottles; extremely hard, very firm, very sticky and very plastic; many large intersecting slickensides; distinct parallelepipeds that have their axis tilted 20 to 45 degrees from horizontal; few medium strongly cemented concretions of calcium carbonate; calcareous; moderately alkaline.

The solum is more than 40 inches thick over calcareous clays and marls. Gilgai or other external features of churning properties are lacking or are minimal because of past erosion. Depth to intersecting slickensides ranges from 3 to 20 inches. Vertical streaks of darker material or old filled cracks range from few to common.

The A1 horizon is black, very dark gray, dark gray, or olive gray. Where the A1 horizon has value of less than 3.5, it is less than 12 inches thick.

The AC1 horizon is dark grayish brown, grayish brown, light brownish gray, olive gray, or light olive gray. Chroma of 2 is dominant in the matrix within a depth of 12 inches in more than half of each pedon. Distinct mottles of light yellowish brown, olive yellow, and yellow are few or common. The clay content of the control section is 60 to 80 percent. Slickensides are large and are common or many. The amplitude of the boundary between the AC1 and AC2 horizons is 10 to 20 inches with a cycle 15 to 20 feet.

The AC2 horizon is light olive gray, light gray, gray, or white. This horizon has few or common mottles of reddish gray, olive yellow, light yellowish brown, and brownish yellow. Slickensides range from many in the upper part to a few in the lower part of this horizon.

Corrigan series

The Corrigan series consists of moderately deep, gently undulating and undulating, loamy, somewhat poorly drained, very slowly permeable soils on uplands. These soils formed in weakly consolidated, acid, tuffaceous sandstone and siltstone. Slope ranges from 1 to 5 percent.

A typical pedon of Corrigan fine sandy loam, in an area of Corrigan-Rayburn association, gently undulating, in Jasper County; from the intersection of U.S. Highway 96 and Texas Highway 63 in Jasper, 10.1 miles northwest along Texas Highway 63, 3.2 miles north along River Ridge Road, 2.4 miles northeast along a forest road to an intersection, 100 feet east, and 100 feet south:

A1—0 to 4 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak fine subangular blocky and granular structure; very friable, soft; common fine roots; very strongly acid; clear smooth boundary.

A2—4 to 8 inches; grayish brown (10YR 5/2) fine sandy loam; weak fine subangular blocky and granular structure; very friable, soft; common fine roots; very strongly acid; abrupt wavy boundary.

B21tg—8 to 17 inches; dark grayish brown (10YR 4/2) clay; common fine and medium prominent red (2.5YR 4/6) mottles; moderate fine blocky structure; very firm, extremely hard, very plastic and sticky; few 1- to 2-inch pressure faces; few clay films on faces of peds; common fine roots; extremely acid; gradual wavy boundary.

B22tg—17 to 24 inches; grayish brown (2.5Y 5/2) clay; few fine yellowish brown and yellowish red mottles; moderate fine blocky structure; very firm, extremely hard, very plastic and sticky; few small pressure faces; few clay films on faces of peds; few fine roots; extremely acid; gradual wavy boundary.

B23t—24 to 32 inches; light brownish gray (2.5Y 6/2) clay; few fine and medium olive gray (5Y 5/2) mottles; root channels coated with olive gray (5Y 4/2); moderate fine blocky and moderate medium subangular blocky structure; very firm; extremely hard, very plastic and sticky; few clay films on faces of peds; few small pressure faces; few fine roots; extremely acid; gradual wavy boundary.

B3&C—32 to 36 inches; pale olive (5Y 6/3) clay and weakly consolidated volcanic tuff; few medium olive gray (5Y 5/2) mottles; root channels and few ped faces coated with dark grayish brown (10YR 4/2); weak medium blocky structure; massive; very firm, extremely hard, very plastic and sticky; C material is friable when moist; few roots; few clay films; extremely acid; clear smooth boundary.

Cr—36 to 60 inches; light olive gray (5Y 6/2) weakly consolidated volcanic tuff; angular fracture faces coated with olive gray (5Y 5/2); few streaks of dark grayish brown (10YR 4/2); massive; hardness is less than 3 on Moh's scale; extremely acid.

Solum thickness and depth to paralithic contact ranges from 20 to 40 inches.

The A horizon is fine sandy loam or loam and is very strongly acid to medium acid. It is 3 to 14 inches thick. The A1 horizon is very dark brown, very dark gray, very dark grayish brown, dark gray, or dark grayish brown. The A2 horizon is dark grayish brown, grayish brown, brown, or light brownish gray. Where moist value is less than 3.5, the horizon is less than 6 inches thick.

The B21tg and B22tg horizons are dark gray, gray, dark grayish brown, grayish brown, light brownish gray, olive gray, light gray, light olive brown, or light yellowish brown. The B23t and B3 horizons have a similar range of colors, but also include olive and pale olive. Mottles are few or common and are red and brown in the upper part and gray and olive in the lower part. Clay content of the upper 20 inches of the Bt horizon averages between 40 to 60 percent, but the upper part of the Bt horizon can be up to 70 percent clay. The lower part of the Bt horizon is clay or silty clay. The COLE of the B21t and B22t horizon is .09 to .14, but the PLE is less than 6 centimeters in the upper 40 inches of the soil. The Bt horizon is extremely acid to strongly acid.

The Cr horizon is weakly consolidated volcanic tuff or tuffaceous sandstone that is bentonitic. However, it contains volcanic ash, volcanic glass, and other pyroclastic material. It is medium acid to extremely acid.

Deweyville series

The Deweyville series consists of deep, nearly level, loamy, very poorly drained soils that formed in acid, organic material. These soils are on bottom lands adjacent to streams that flood frequently. These soils are saturated continuously. Slope is less than 1 percent.

A typical pedon of Deweyville mucky silt loam, in an area of Deweyville soils, frequently flooded, in Newton County; from the intersection of Farm Road 82 and Texas Highway 87 about 5.5 miles east of Kirbyville, 4.0 miles south on Texas Highway 87, 2.0 miles southeast on Farm Road 2829, 2.6 miles south on a county road, 0.9 mile northeast along a forest road, and 150 feet north, in forest. The site is about 2,500 feet west of the Sabine River:

A1—0 to 4 inches; very dark grayish brown (10YR 3/2) broken face, mucky silt loam; 78 percent mineral material; about 20 percent fiber unrubbed, 8 percent fiber rubbed; fibers are 1 to 10 millimeters in size; massive; very friable, slightly sticky and slightly plastic; many medium and large roots; extremely acid (pH 3.8 in 0.01 mole calcium chloride); gradual smooth boundary.

Oe1—4 to 36 inches; dark brown (7.5YR 3/2) broken face, hemic material, dark brown (7.5YR 3/2) rubbed; about 52 percent fiber unrubbed, 24 percent fiber rubbed; fibers are 1 millimeter to 5 centimeters; massive; common medium and large roots; about 40 percent mineral material; extremely acid (pH 4.0 in 0.01 mole calcium chloride); diffuse smooth boundary.

Oa1—36 to 70 inches; dark brown (7.5YR 3/2) broken face, hemic material, dark brown (7.5YR 3/2) rubbed; about 20 percent fiber unrubbed, 5 percent rubbed; fibers are 1 millimeter to 5 centimeters in size; estimated 30 percent mineral material; massive; extremely acid (pH 4.0 in 0.01 mole calcium chloride).

The organic material ranges from 51 to more than 80 inches in thickness. The pH is 3.7 to 4.5 in 0.01 mole calcium chloride in all horizons.

The A horizon is very dark grayish brown, black, and very dark gray. It is mucky silt loam or mucky silty clay loam. The fiber content averages about 15 to 30 percent unrubbed and 5 to 20 percent rubbed. In some pedons the surface layer is organic. Mineral content ranges from 50 to 80 percent and is mostly silt and clay.

The Oe1 horizon is dark reddish brown, black, dark brown, very dark gray, or very dark grayish brown. The fiber content in the Oe1 and Oe2 horizons averages about 40 to 70 percent unrubbed and 15 to 35 percent rubbed. Mineral content ranges from 25 to 50 percent. Fiber size ranges mostly from 1 millimeter to 8 centimeters but it includes decayed logs up to 20 centimeters in diameter.

The Oa1 horizon has colors similar to those of the Oe1 horizon. Fiber content ranges from 20 to 30 percent unrubbed and 5 to 15 percent rubbed. Some pedons do not have an Oa1 horizon.

Doucette series

The Doucette series consists of deep, undulating, sandy, well drained, moderately permeable soils on uplands. These soils formed in sandy and loamy coastal plain sediment. Slope ranges from 1 to 8 percent.

A typical pedon of Doucette loamy fine sand, in Newton County; from the intersection of U.S. Highway 190 and Texas Highway 87 in Newton, 4.1 miles northeast on Texas Highway 87, 1.2 miles east on Farm Road 1414, 800 feet southeast along a forest road to a gate, 1.3 miles south along a forest road, 800 feet east along a forest trail, and 200 feet north, in forest:

A11—0 to 5 inches; dark grayish brown (10YR 4/2) loamy fine sand; single grained; soft, very friable, nonsticky and nonplastic; many fine and medium roots; medium acid; clear smooth boundary.

A12—5 to 12 inches; brown (10YR 5/3) loamy fine sand; single grained; soft, very friable, nonsticky and nonplastic; many fine and medium roots; medium acid; gradual smooth boundary.

A2—12 to 24 inches; light yellowish brown (10YR 6/4) loamy fine sand; few medium yellowish brown (10YR 5/4) stains; single grained; soft, very friable, nonsticky and nonplastic; few fine and medium roots; strongly acid; clear smooth boundary.

B21t—24 to 38 inches; strong brown (7.5YR 5/6) sandy clay loam; few medium faint brownish yellow (10YR 6/6) mottles and few medium prominent red (2.5YR 4/6) mottles; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few medium and coarse roots; few patchy clay films on faces of peds; about 2 percent by volume plinthite in the lower part; very strongly acid; gradual smooth boundary.

B22t—38 to 54 inches; strong brown (7.5YR 5/6) sandy clay loam; few medium faint brownish yellow (10YR 6/6) mottles and many medium prominent red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; few medium roots; few patchy clay films on faces of peds; about 5 percent by volume plinthite; very strongly acid; gradual smooth boundary.

B23t—54 to 68 inches; brownish yellow (10YR 6/6) sandy clay loam; few medium distinct light brownish gray (10YR 6/2) and pale brown (10YR 6/3) mottles and few medium prominent red (2.5YR 4/6) mottles; weak medium subangular blocky structure; hard, firm, sticky and plastic; about 10 percent by volume plinthite; few patchy clay films on faces of peds; very strongly acid; gradual smooth boundary.

B24t—68 to 80 inches; mottled reddish yellow (7.5YR 6/6) and brownish yellow (10YR 6/6) sandy clay loam; common medium distinct yellowish red (5YR 5/6) mottles; weak medium subangular blocky structure; hard, firm, sticky and plastic; very strongly acid.

The solum ranges from 60 to more than 80 inches in thickness. Depth to horizons containing plinthite ranges from 35 to 60 inches.

The A horizon is 20 to 40 inches thick. The A horizon is loamy fine sand or fine sand. The A1 horizon is dark grayish brown, grayish brown, light brownish gray, or brown. The A2 horizon is brown, pale brown, yellowish brown, or light yellowish brown. Reaction is medium acid or strongly acid.

The Bt horizon is yellowish brown, brownish yellow, strong brown, and reddish yellow. Mottles in shades of red, yellow, and gray are in the lower part of most pedons. Plinthite content ranges from 5 to 20 percent. Reaction is strongly acid or very strongly acid.

Evadale series

The Evadale series consists of deep, nearly level loamy, poorly drained, very slowly permeable soils that formed in unconsolidated, clayey sediment. These soils are on smooth, plane areas or in slight depressions on terraces and uplands. Slope ranges from 0 to 1 percent.

A typical pedon of Evadale silt loam, in an area of Evadale-Gist complex, gently undulating, in Jasper

County; from the intersection of U.S. Highway 96 and Farm Road 2246 at Evadale, 1.0 mile east on Farm Road 2246, 1.7 miles northeast and east on a county road, and 220 feet north, in forest:

A1—0 to 3 inches; dark grayish brown (10YR 4/2) silt loam; many fine and medium faint light brownish gray (10YR 6/2) mottles; weak fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; many fine roots; very strongly acid; clear wavy boundary.

A2g—3 to 10 inches; grayish brown (10YR 5/2) silt loam; many fine prominent yellowish red (5YR 5/6) mottles; weak medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; many fine and few medium roots; very strongly acid; gradual irregular boundary.

B21tg&A2—10 to 18 inches; gray (10YR 5/1) silty clay loam (B2t); 20 percent by volume tongues, 1 inch to 3 inches wide, of light brownish gray (10YR 6/2) silt loam (A2); common medium prominent reddish brown (5YR 5/4) and yellowish red (5YR 5/6) mottles; Bt part has weak medium prismatic structure parting to moderate medium subangular blocky and is hard, firm, sticky and plastic; A2 part is massive and is hard, friable, slightly sticky and slightly plastic; common fine and few medium roots; very strongly acid; gradual wavy boundary.

B22tg&A2—18 to 40 inches; gray (10YR 5/1) clay (B2t); 25 percent by volume tongues, 1/2 inch to 2 inches wide, of light brownish gray (10YR 6/2) silt loam (A2); common medium prominent strong brown (7.5YR 5/6) mottles and few fine distinct greenish gray (5G 5/1) mottles; Bt part has weak medium prismatic structure parting to moderate medium angular blocky and is hard, firm, very sticky and very plastic; A2 part is massive and is hard, friable, slightly sticky and slightly plastic; few fine roots; thin sand and silt coatings on some ped faces; few small black concretions; gradual wavy boundary.

B23tg—40 to 70 inches; gray (10YR 5/1) clay (B2t); 20 percent by volume tongues, 1/4 inch to 2 inches wide, of light brownish gray (10YR 6/2) silt loam (A2); common medium prominent strong brown (7.5YR 5/6) and few fine distinct greenish gray (5G 5/1) mottles; Bt part has weak medium prismatic structure parting to moderate medium angular blocky and is hard, firm, very sticky and very plastic; A2 part is massive and is hard, friable, slightly sticky and slightly plastic; few small black concretions; few salt crystals; strongly acid.

The solum ranges from 60 to more than 80 inches in thickness.

The A horizon is 9 to 20 inches thick. Tongues of A2 material extend to a greater depth. The A horizon is silt loam or loam. Reaction is very strongly acid to medium acid. The A1 horizon is very dark gray, very dark grayish brown, dark grayish brown, dark gray, grayish brown, or gray. Mottles are in shades of light brownish gray and gray. The A2g horizon is gray, grayish brown, light brownish gray, and light gray. Mottles are in shades of brown, yellow, and red.

The Bt horizon is clay, silty clay, clay loam, or silty clay loam. Tongues or penetrations of silt loam, very fine sandy loam, or loam A2 material extend from a depth of 24 inches to a depth of more than 60 inches. Reaction of the Bt horizon is very strongly acid or strongly acid. The Btg horizon is gray, grayish brown, and light brownish gray. Mottles in shades of gray, yellow, brown, and red are few or common. Some pedons contain gypsum and other salt crystals in the lower part.

Gallime series

The Gallime series consists of deep, gently undulating, loamy, well drained, moderately permeable soils on terraces. These soils formed in loamy, unconsolidated sediment. Slope ranges from 0 to 3 percent.

A typical pedon of Gallime fine sandy loam, in an area of Gallime-Spurger association, gently undulating, in Newton County; from the intersection of Texas Highway 87 and Farm Road 1416 south of Bleakwood, 4.5 miles east on Farm Road 1416, 0.4 mile northeast on a forest road, and 150 feet north, in forest:

A1—0 to 4 inches; dark brown (10YR 4/3) fine sandy loam; weak medium granular structure; soft, very friable; common fine roots; medium acid, clear smooth boundary.

A2—4 to 26 inches; light yellowish brown (10YR 6/4) fine sandy loam; common medium distinct reddish yellow (7.5YR 6/6) mottles; weak coarse subangular blocky structure; soft, very friable; common fine roots; few fine pores; medium acid; clear smooth boundary.

B21t&A2—26 to 29 inches; yellowish red (5YR 5/6) sandy clay loam; about 10 percent streaks and coatings of light brown (7.5YR 6/4) fine sandy loam; weak medium subangular blocky structure; slightly hard, friable; few fine roots; few medium pores; strongly acid; clear smooth boundary.

B22t—29 to 48 inches; yellowish red (5YR 5/6) sandy clay loam; moderate medium subangular blocky structure; slightly hard, friable; few fine roots; few fine pores; strongly acid; gradual wavy boundary.

B23t&A'2—48 to 62 inches; yellowish red (5YR 5/6) loam; about 10 percent streaks and coatings of reddish yellow (7.5YR 6/6) fine sandy loam; weak medium subangular blocky structure; slightly hard, friable; very strongly acid.

The solum is more than 60 inches thick.

The A horizon is 20 to 38 inches thick. It is fine sandy loam or loam. The A1 horizon is brown, dark brown, dark grayish brown, or yellowish brown. The A2 horizon is brown, pale brown, and light yellowish brown. Reaction is strongly acid to slightly acid.

The B2t horizon is strong brown or yellowish red. It is sandy clay loam or loam. Reaction is very strongly acid to medium acid.

The B2t&A'2 horizon has colors similar to those of the upper part of the B2t horizon. In addition, it has mottles in shades of red, brown, and gray. The A'2 soil material makes up 5 to 20 percent of the horizon.

Gist series

The Gist series consists of deep, gently undulating, loamy, moderately well drained, very slowly permeable soils on uplands. These soils formed in clayey, unconsolidated sediment that has been modified by wind. Gist soils typically occupy mounds that are 50 to 200 feet in diameter and 1 to 3 feet higher than the intermound areas. Slope ranges from 0 to 4 percent.

A typical pedon of Gist very fine sandy loam, in an area of Evadale-Gist complex, gently undulating, in Jasper County; from the intersection of U.S. Highway 96 and Farm Road 2246 at Evadale, 1 mile east on Farm Road 2246, 1.7 miles northeast and east on a county road, and 180 feet north, in forest on a mound:

A1—0 to 4 inches; dark grayish brown (10YR 4/2) very fine sandy loam; weak fine granular structure; soft, very friable, slightly sticky and nonplastic; many fine and medium roots, few coarse roots; strongly acid; clear wavy boundary.

A2—4 to 16 inches; light yellowish brown (10YR 6/4) very fine sandy loam; many medium faint mottles and stains of dark grayish brown (10YR 4/2); weak medium subangular blocky structure parting to weak fine granular; soft, very friable, slightly sticky and nonplastic; common fine and medium roots, few coarse roots; strongly acid; diffuse irregular boundary.

B21t&A2—16 to 25 inches; yellowish brown (10YR 5/4) loam (B2t); about 20 percent of the horizon is tongues of very pale brown (10YR 7/4) very fine sandy loam (A2); few fine faint light gray (10YR 7/2) mottles in lower part; weak fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few fine, medium, and coarse roots; strongly acid; diffuse smooth boundary.

B22t&A2—25 to 41 inches; yellowish brown (10YR 5/4) loam (B2t); about 20 percent of the horizon is tongues of very pale brown (10YR 7/4) very fine sandy loam (A2); common medium distinct gray (10YR 6/1) mottles and few medium distinct brownish yellow (10YR 6/8) mottles; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine and medium roots; about 10 percent by volume of the B2 part is brittle; very strongly acid; clear irregular boundary.

B23t&A2—41 to 52 inches; gray (10YR 5/1) clay loam (B2t); about 15 percent of the horizon is tongues of light gray (10YR 7/2) very fine sandy loam (A2); few medium prominent red (2.5YR 4/6) mottles; moderate subangular blocky structure; hard, firm, sticky and plastic; very strongly acid; clear irregular boundary.

B24t—52 to 80 inches; gray (10YR 5/1) clay; common medium prominent red (2.5YR 4/6) mottles and few medium prominent strong brown (7.5YR 5/6) mottles; moderate medium blocky structure; hard, very firm, sticky and plastic; interfingers of very fine sandy loam A2 material make up 2 percent by volume of the horizon; very strongly acid.

The solum is more than 60 inches thick.

The A horizon is very fine sandy loam, loam, or silt loam. The A1 horizon is dark grayish brown or grayish brown. The A2 horizon is grayish brown, brown, pale brown, light yellowish brown, or light brownish gray. Reaction is strongly acid or medium acid.

The B21t&A2 and B22t&A2 horizons are loam or silt. Clay content is less than 18 percent, and less than 15 percent is coarser than very fine sand. The horizons are brown, strong brown, light yellowish brown, or yellowish brown. The tongues of A2 material are light brownish gray, pale brown, very pale brown, light yellowish brown, or light gray. Mottles are few or common and are gray, light gray, light brownish gray, and brownish yellow. In some pedons, consistence is brittle in up to 25 percent of the lower part of these horizons. Reaction is very strongly acid or strongly acid. The B23t&A2 and B24t horizons are clay loam, silty clay, or clay. The horizons are gray, grayish brown, or light brownish gray. Mottles are in shades of red, brown, and yellow. The upper part of these horizons has light gray tongues of very fine sandy loam or silt loam. The volume of A2 material decreases as depth increases. In some pedons, at a depth of more than 70 inches, reaction ranges to neutral.

Gladewater series

The Gladewater series consists of deep, nearly level, loamy, poorly drained, very slowly permeable soils on bottom lands. These soils formed in clayey alluvium. These soils are commonly flooded once each year for several days. Slope is mostly less than 1 percent, but it ranges up to 2 percent.

A typical pedon of Gladewater clay loam, in an area of Gladewater soils, frequently flooded, in Newton County; from Burkeville, at the intersection of Texas Highway 63 and Texas Highway 87, 3.0 miles south along Texas Highway 87 to Yellow Bayou Bridge, 1 mile south along Texas Highway 87, and 600 feet northwest, in pasture:

A1—0 to 4 inches; dark gray (10YR 4/1) clay loam; moderate medium granular structure; hard, firm, sticky and plastic; common fine roots; medium acid; clear wavy boundary.

B21g—4 to 10 inches; gray (10YR 5/1) clay; moderate medium subangular blocky structure; extremely hard, very firm, sticky and very plastic; few fine roots; medium acid; diffuse smooth boundary.

B22g—10 to 26 inches; gray (10YR 5/1) clay; common medium distinct yellowish brown (10YR 5/8) mottles and few medium distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; extremely hard, very firm, sticky and very plastic; medium acid; diffuse smooth boundary.

B23g—26 to 45 inches; dark gray (10YR 4/1) clay; few medium distinct yellowish brown (10YR 5/8) mottles; massive; extremely hard, very firm, sticky and very plastic; medium acid; diffuse smooth boundary.

Cg—45 to 65 inches; very dark gray (10YR 3/1) clay; few medium faint yellowish brown mottles (10YR 5/6) and few medium prominent red (2.5YR 4/6) mottles; massive; extremely hard, very firm, sticky and very plastic; medium acid.

The solum ranges from 30 to 50 inches in thickness.

The A horizon is very dark gray, dark gray, or very dark grayish brown. It is clay loam or clay. Reaction ranges from medium acid to neutral.

The B2g horizon is dark gray, gray, or light brownish gray. There are few or common mottles of yellowish brown or reddish brown. The B2g horizon is clay or silty clay. Reaction is very strongly acid to slightly acid.

The Cg horizon is very dark gray or gray. Mottles are in shades of brown or red. The Cg horizon is clay, but it is stratified with clay loam in some pedons. Reaction ranges from strongly acid to slightly acid.

Iuka series

The Iuka series consists of deep, nearly level, loamy, moderately well drained, moderately permeable soils on bottom lands. These soils formed in recent sandy and loamy alluvium. The soils are subject to flooding. Slope is less than 2 percent.

A typical pedon of Iuka fine sandy loam, in an area of Iuka soils, frequently flooded, in Jasper County; from the intersection of U.S. Highway 96 and Farm Road 1005, 6 miles south of Jasper, 500 feet south on U.S. Highway 96 to a county road, 1.85 miles southeast on a county road, 150 feet south on a forest trail, and 10 feet west, in forest. The site is 100 feet west of Everett Creek:

A11—0 to 8 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; slightly hard, friable; many fine, medium, and coarse tree roots; strongly acid; clear smooth boundary.

A12—8 to 14 inches; brown (10YR 5/3) fine sandy loam; common medium faint brown mottles; weak fine granular structure; slightly hard, friable; few fine and coarse and many medium tree roots; strongly acid; clear smooth boundary.

C1—14 to 34 inches; light yellowish brown (10YR 6/4) fine sandy loam that has few thin strata of loamy fine sand; many medium distinct light gray (10YR 7/1, 7/2) mottles; massive; very friable; few medium and coarse roots; very strongly acid; gradual smooth boundary.

C2—34 to 45 inches; light yellowish brown (10YR 6/4) loamy fine sand; many medium distinct light gray (10YR 7/1, 7/2) mottles; massive; very friable; very strongly acid; gradual smooth boundary.

C3—45 to 64 inches; light yellowish brown (10YR 6/4) fine sand; many medium distinct very pale brown (10YR 7/3) mottles; massive; very friable; very strongly acid.

Thin bedding planes of contrasting texture are common in most pedons. The average clay content of the 10- to 40-inch control section ranges from 10 to 18 percent. Soil reaction is strongly acid or very strongly acid.

The A horizon is brown, dark grayish brown, or light yellowish brown. It is mostly fine sandy loam but ranges to sandy loam and loam.

The C horizon is light yellowish brown, pale brown, brown, or yellowish brown and is mottled with light gray, gray, light brownish gray, and grayish brown. In some pedons the lower part of the C horizon is dominated by gray and mottled with yellow and brown. The upper part of the C horizon is mostly fine sandy loam but ranges to loamy sand and loam. The lower part of the C horizon is stratifications mostly of fine sandy loam, but it ranges to fine sand, loamy sand, loam, sandy clay loam, and clay loam.

Jasco series

The Jasco series consists of deep, nearly level, loamy, ponded, very slowly permeable soils that formed in unconsolidated, loamy coastal plain sediment. These soils are in low, depressional areas on uplands. Slope is 0 to 1 percent.

A typical pedon of Jasco silt loam, 0 to 1 percent slopes, in Jasper County; from the intersection of Farm

Road 82 and U.S. Highway 96 in Kirbyville, 3.6 miles south to the intersection of Farm Road 1004 and U.S. Highway 96, 2.3 miles west along Farm Road 1004 to a forest road, 0.3 mile north along a forest road, and 180 feet west of the road:

A1—0 to 4 inches; brown (10YR 5/3) silt loam; few fine distinct strong brown (7.5YR 5/6) mottles; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky; common fine roots; many fine and medium vesicular pores; strongly acid; clear smooth boundary.

A2g—4 to 23 inches; light brownish gray (10YR 6/2) silt loam; common medium distinct strong brown (7.5YR 5/6) mottles and common medium faint brown (10YR 5/3) mottles; weak coarse prismatic structure parting to weak medium subangular blocky; slightly hard, friable; few medium and fine roots; common fine pores; very strongly acid; clear irregular boundary.

Bx—23 to 44 inches; grayish brown (10YR 5/2) loam; many coarse distinct strong brown (7.5YR 5/6) mottles and few fine distinct yellowish brown (10YR 5/6) mottles; moderate coarse prismatic structure parting to weak thick platy; very hard, firm; brittle in 80 percent of the cross section; indistinct polygonal veins of friable grayish silt; crayfish krotovinas and tongues of silt loam comprise 35 percent of the horizon; about 50 percent of the tongues are brittle; thin coatings of clear sand grains are on some vertical ped surfaces; common fine vesicular pores; very strongly acid; abrupt irregular boundary.

B2t&A'2—44 to 65 inches; mottled brownish yellow (10YR 6/6) and light brownish gray (10YR 6/2) silty clay loam; moderate medium subangular blocky structure; very hard, very firm; tongues and krotovinas of very fine sandy loam comprise about 20 percent of the horizon; few brittle bodies in tongues; thin coatings of clean sand grains are on some vertical ped surfaces; very strongly acid.

The solum ranges from 60 to more than 80 inches in thickness. Depth to the fragipan ranges from 15 to 30 inches. Reaction ranges from strongly acid to extremely acid throughout the pedon.

The A horizon is 15 to 30 inches thick. It is silt loam or loam. The A1 horizon is dark grayish brown, very dark gray, very dark grayish brown, grayish brown, or brown. The A2 horizon is brown, gray, light brownish gray, or light gray. Brownish mottles are few or common.

The Bx horizon is brown, grayish brown, light brownish gray, or light gray. Brownish mottles range from few to many. The tongues of A2 material are silt loam or very fine sandy loam and are light brownish gray, pale brown, light gray, very pale brown, or light yellowish brown. The tongues make up about 35 percent of the horizon. The Bx horizon has from 60 to 95 percent brittleness.

The B2t&A'2 horizon is yellowish brown, light brownish gray, brown, or strong brown. Some pedons have mottles of red. The tongues of A'2 material are light yellowish brown, pale brown, light gray, or very pale brown. The tongues make up about 20 percent of the horizon. This horizon is very firm and brittle in 15 to 30 percent of the cross section.

Kirbyville series

The Kirbyville series consists of deep, gently undulating, loamy, somewhat poorly drained, moderately permeable soils on uplands. These soils formed in loamy coastal plain sediment. Slope is 0 to 5 percent.

A typical pedon of Kirbyville fine sandy loam, in an area of Kirbyville-Waller association, gently undulating, in Jasper County; from the intersection of U.S. Highway 96 and Farm Road 1004 at Call Junction, 1.6 miles west on Farm Road 1004, 0.8 mile south on a forest road to an intersection, 300 feet east on a forest trail, and 150 feet north, in forest:

A1—0 to 5 inches; grayish brown (10YR 5/2) fine sandy loam; weak medium subangular blocky structure; soft, friable, slightly sticky and nonplastic; many fine and medium roots and few coarse roots; medium acid; clear smooth boundary.

A2—5 to 18 inches; very pale brown (10YR 7/4) fine sandy loam; common medium faint light gray (10YR 7/2) mottles; weak medium subangular blocky structure; soft, friable, nonsticky and nonplastic; many fine and medium roots and few coarse roots; few rounded ironstone pebbles about 5 to 10 millimeters in size; strongly acid; clear irregular boundary.

B21t&A2—18 to 35 inches; light yellowish brown (10YR 6/4) sandy clay loam; common medium faint brownish yellow (10YR 6/6) mottles in ped interiors; 20 percent of the horizon is tongues of very pale brown (10YR 7/3) fine sandy loam; common medium faint light gray (10YR 7/2) mottles on surfaces of peds; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many fine and medium roots and few coarse roots; few patchy clay films; few rounded ironstone pebbles about 5 to 10 millimeters in size; strongly acid; clear irregular boundary.

B22t&A2—35 to 56 inches; strong brown (7.5YR 5/8) sandy clay loam; common medium prominent red (2.5YR 4/6) mottles; 35 percent of the horizon is tongues of light gray (10YR 7/2) fine sandy loam; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few patchy clay films; 8 percent plinthite; strongly acid; clear irregular boundary.

B23t&A2—56 to 75 inches; brownish yellow (10YR 6/6) sandy clay loam; common medium faint red (2.5YR 4/6) mottles; light gray (10YR 6/1) coatings on faces of peds; 40 percent of the horizon is tongues of light gray (10YR 7/1) fine sandy loam; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few patchy clay films; 8 percent plinthite; very strongly acid.

The solum ranges from 60 to more than 80 inches in thickness.

The A horizon is fine sandy loam or very fine sandy loam. Reaction is medium acid to very strongly acid. The A1 horizon is dark grayish brown, brown, grayish brown, or light brownish gray. The A2 horizon is brown, yellowish brown, pale brown, light yellowish brown, brownish yellow, or very pale brown. It contains mottles or stains of yellowish brown, brownish yellow, and light gray.

The B2&A2 horizon is sandy clay loam or loam. Reaction is strongly acid or very strongly acid. Clay content of the upper 20 inches is 18 to 25 percent. The B2 part of the horizon is yellowish brown, light yellowish brown, brownish yellow, brown, strong brown, or reddish yellow,. The A2 horizon part of the horizon is light gray, light brownish gray, or pale brown. Tongues of A2 material make up 15 to 40 percent by volume of these horizons. The volume of A2 material increases with depth. Plinthite makes up from 5 to about 15 percent of most pedons and is commonly below a depth of 30 inches. Mottles in shades of red, brown, and yellow are few or common in ped interiors. Gray mottles caused by wetness are few or common on ped exteriors.

Kisatchie series

The Kisatchie series consists of moderately deep, sloping to hilly, loamy, well drained, very slowly permeable soils on uplands. These soils formed in weakly consolidated, acid, tuffaceous sandstone and siltstone. Slope ranges from 5 to 20 percent.

A typical pedon of Kisatchie fine sandy loam, in an area of Kisatchie-Rayburn association, hilly, in Jasper County; from intersection of U.S. Highway 96 and Farm Road 255, 7 miles north of Jasper, 4 miles west on Farm Road 255, 1.2 miles south on a dirt road, and 100 feet west, in forest:

A1—0 to 3 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine subangular blocky and granular structure; soft, very friable, nonsticky and nonplastic; very strongly acid; clear smooth boundary.

A2—3 to 5 inches; grayish brown (10YR 5/2) very fine sandy loam; weak fine subangular blocky structure parting to granular; soft, very friable, nonsticky and nonplastic; very strongly acid; abrupt wavy boundary.

B21t—5 to 11 inches; grayish brown (2.5YR 2/2) clay; moderate fine blocky structure; extremely hard, very firm, very sticky and very plastic; very strongly acid; gradual wavy boundary.

B22t—11 to 22 inches; light brownish gray (2.5Y 6/2) clay; moderate fine blocky structure; very firm, very sticky and very plastic; few dark stains on faces of some peds; few fine light yellowish brown mottles; very strongly acid; gradual wavy boundary.

B3—22 to 35 inches; light gray (2.5Y 7/2) clay; moderate fine blocky structure; very firm, very sticky and very plastic; common fragments of siltstone in the lower part; few clay films on surfaces of siltstone fragments; few fine pale olive mottles; very strongly acid; clear irregular boundary.

Cr—35 to 50 inches; light brownish gray (2.5Y 6/2) siltstone; weakly cemented plates 1 centimeter to 5 centimeters thick; clay flows and coatings in the upper part along the cracks and fractures; very strongly acid.

Solum thickness and depth to paralithic contact ranges from 20 to 40 inches.

The A horizon is fine sandy loam or very fine sandy loam. It is strongly acid or very strongly acid. The A1 horizon is dark grayish brown, very dark grayish brown, very dark gray, or dark gray. The A2 horizon is grayish brown, gray, or light brownish gray. Where moist value is less than 3.5, the horizon is less than 7 inches thick. Some pedons do not have an A2 horizon.

The B2t horizon is grayish brown, light olive gray, light brownish gray, light gray, and dark grayish brown. The B3 horizon has colors similar to those of the B2t horizon, and in addition it ranges to light gray, light olive brown, olive, and pale olive. Clay content of the upper 20 inches of the Bt horizon ranges from 35 to 55 percent. Mottles are few or common in shades of brown and olive. The B3 horizon commonly contains fragments of siltstone or sandstone. The Bt horizon is very strongly acid or extremely acid.

The C horizon is weakly consolidated, tuffaceous siltstone and sandstone.

Letney series

The Letney series consists of deep, undulating to hilly, sandy, well drained soils on uplands (fig. 15). Permeability is moderately rapid. These soils formed in thick, sandy and loamy sediment of the coastal plain. Slope ranges from 1 to 20 percent.

A typical pedon of Letney loamy sand, in an area of Tehran-Letney association, hilly, in Newton County; from the intersection of Farm Road 692 and Texas Highway 63 at Burkeville, 10.2 miles north along Farm Road 692, 1.8 miles northwest on a forest road, 0.6 mile northeast on a forest trail, and 150 feet north, in forest:

A1—0 to 7 inches; dark grayish brown (10YR 4/2) loamy sand; common stains of brown (10YR 5/3); single grained; loose, nonsticky and nonplastic; few medium and coarse roots; very strongly acid; clear smooth boundary.

A2—7 to 34 inches; pale brown (10YR 6/3) loamy sand; single grained; loose, nonsticky and nonplastic; few medium and coarse roots; 5 to 10 percent siliceous gravel; few krotovinas; very strongly acid, clear smooth boundary.

B2t—34 to 62 inches; strong brown (7.5YR 5/6) sandy clay loam; common medium faint reddish yellow (7.5YR 6/8) mottles and few medium distinct yellowish red (5YR 5/8) mottles; moderate medium subangular blocky structure; very hard, friable, slightly sticky and slightly plastic; few medium and coarse roots; 5 to 10 percent siliceous gravel; sand grains coated and bridged with clay; very strongly acid; diffuse smooth boundary.

B3—62 to 75 inches; reddish yellow (7.5YR 6/8) sandy clay loam; few medium prominent red (2.5YR 4/6) mottles; weak medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; many small white and purple bodies of shale and clay; very strongly acid.

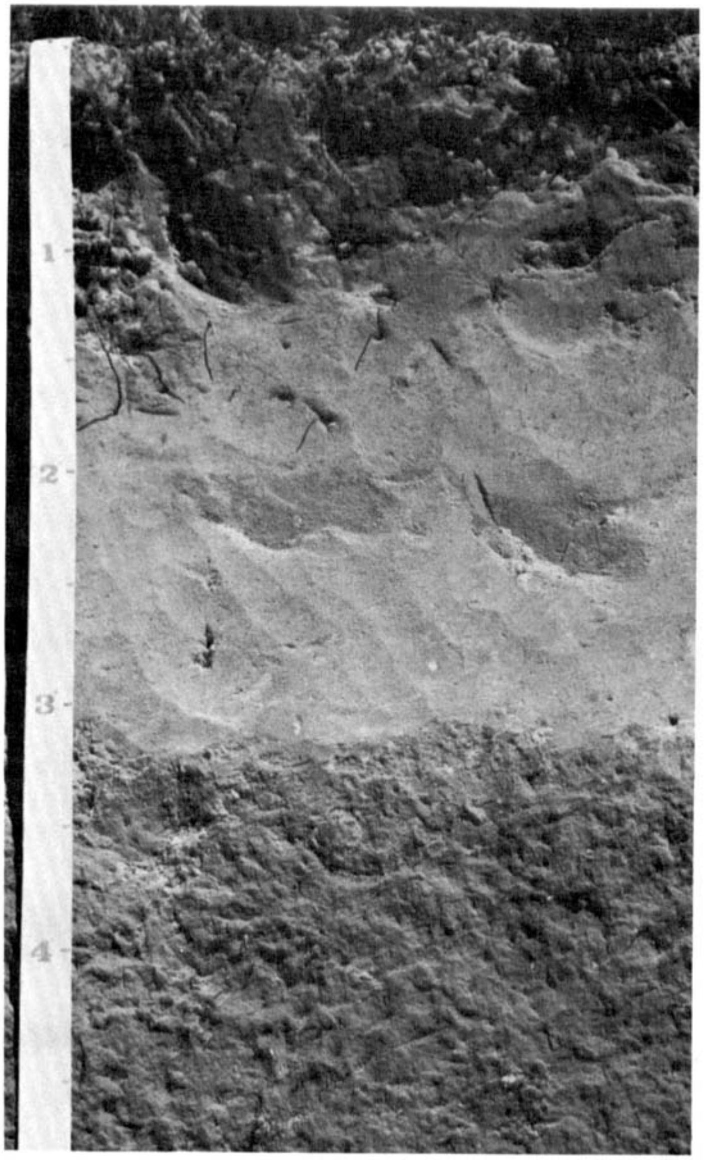


Figure 15.—A profile of Letney loamy sand. The thick surface layer extends to a depth of about 37 inches.

The solum ranges from 60 to more than 80 inches in thickness. Reaction ranges from very strongly acid to medium acid. Clay content of the upper 20 inches of the argillic horizon ranges from 18 to 32 percent. Base saturation ranges from 15 to 30 percent. Ten to 25 percent of the sand fraction is coarse sand and very coarse sand.

The A1 horizon is very dark grayish brown, dark brown, dark grayish brown, or brown. Where value is less than 3.5, the thickness of the horizon is less than 7 inches. The A2 horizon is brown, yellowish brown, pale brown, light yellowish brown, or very pale brown. Some pedons contain up to 10 percent siliceous gravel in the A horizon.

The B2t horizon is yellowish brown, brownish yellow, strong brown, or reddish yellow. Mottles in shades of yellow, red, brown, and gray are in the lower part of the Bt horizon. Mottles that have chroma of 2 or less are at a depth of 60 inches or more. The B2t horizon is mostly sandy clay loam, but it ranges to sandy loam in some pedons. In some pedons the Bt horizon contains up to 5 percent plinthite by volume, and in some pedons it contains up to 10 percent by volume siliceous gravel.

The B3 horizon has a range of colors similar to that of the B2t horizon. Many small, white and purple shale fragments and clay bodies are in some pedons.

Malbis series

The Malbis series consists of deep, gently undulating, loamy, moderately well drained soils on uplands. Permeability is moderately slow. These soils formed in thick beds of unconsolidated, loamy coastal plain sediment (fig. 16). Slope ranges from 0 to 5 percent.

A typical pedon of Malbis fine sandy loam, 1 to 5 percent slopes, in Jasper County; from the intersection of U.S. Highway 96 and Farm Road 82 in Kirbyville, 5.1 miles west on Farm Road 82, 0.8 mile north on a forest road, and 150 feet west of the road, in forest:

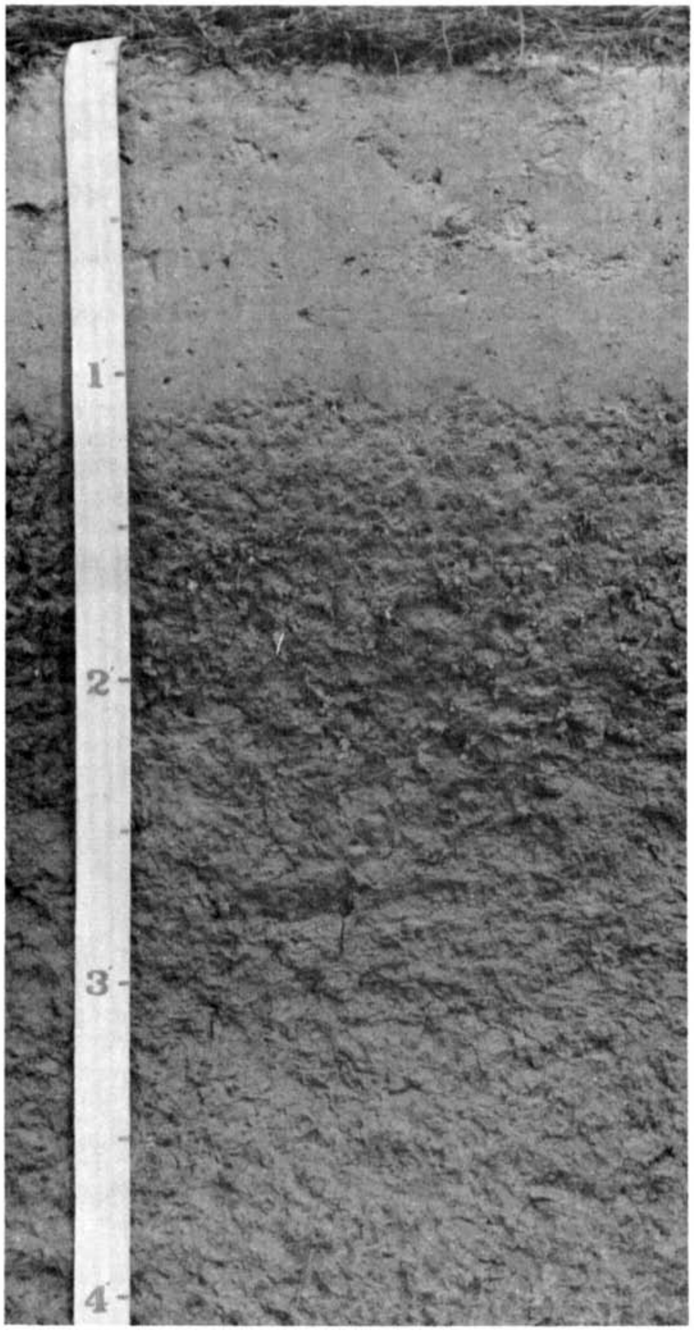


Figure 16.—A profile of Malbis fine sandy loam. The surface layer is fine sandy loam and the subsoil is sandy clay loam. (The scale is in feet.)

A1—0 to 5 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine subangular blocky structure parting to weak medium granular; soft, very friable, slightly sticky and nonplastic; common fine roots and few medium and coarse roots; few rounded ironstone pebbles up to 15 millimeters across; strongly acid; clear smooth boundary.

A2—5 to 13 inches; brown (10YR 5/3) and grayish brown (10YR 5/2) fine sandy loam; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; few fine, medium, and coarse roots; few rounded ironstone pebbles up to 15 millimeters across; strongly acid; clear smooth boundary.

B21t—13 to 26 inches; yellowish brown (10YR 5/6) sandy clay loam; weak medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; few thin patchy clay films on faces of peds; few rounded ironstone pebbles up to 15 millimeters across; strongly acid; gradual smooth boundary.

B22t—26 to 36 inches; yellowish brown (10YR 5/8) sandy clay loam; common medium distinct strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; thin patchy clay films on faces of peds; about 8 percent rounded ironstone pebbles up to 15 millimeters across; very strongly acid; gradual smooth boundary.

B23t—36 to 54 inches; yellowish brown (10YR 5/8) sandy clay loam; common medium prominent red (2.5YR 4/6) and yellowish red (5YR 5/6) mottles and common medium distinct strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; thin patchy clay films on faces of peds; about 10 percent by volume plinthite; about 5 percent by volume brittle masses; few rounded ironstone pebbles up to 15 millimeters across; very strongly acid; gradual smooth boundary.

B24t—54 to 72 inches; yellowish brown (10YR 5/8) sandy clay loam; common medium faint light yellowish brown (10YR 6/4) and brownish yellow (10YR 6/6) mottles and few medium distinct light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; thin patchy clay films on faces of peds; about 10 percent by volume plinthite; about 5 percent by volume brittle masses; few small spots of uncoated sand; very strongly acid.

The solum ranges from 60 to more than 80 inches in thickness. Plinthite makes up 5 to 25 percent of some subhorizon within 60 inches of the surface. Base saturation ranges from 10 to 35 percent and CEC ranges from 5 to 10 milliequivalents per 100 grams of the soil at a depth of 50 inches below the top of the argillic horizon.

Clay content in the upper 20 inches of the argillic horizon ranges from 18 to 35 percent.

The A horizon ranges from 7 to 25 inches in thickness. Ironstone pebbles range from 0 to 10 percent by volume. Reaction ranges from very strongly acid to slightly acid. The A1 horizon is very dark gray, very dark grayish brown, dark gray, dark grayish brown, grayish brown, or brown. The A2 horizon is dark grayish brown, brown, grayish brown, yellowish brown, light brownish gray, pale brown, or light yellowish brown.

The Bt horizon is fine sandy loam, clay loam, or sandy clay loam. Reaction is very strongly acid or strongly acid. The B21t and B22t horizons are yellowish brown, light yellowish brown, brownish yellow, strong brown, or reddish yellow. Mottles range from none to common in shades of brown and red. Plinthite ranges from 0 to 5 percent. The B23t and B24t horizons are yellowish brown, light yellowish brown, brownish yellow, reddish yellow, or strong brown. Mottles are few or common in shades of brown, red, gray, and yellowish brown. Depth to horizons having mottles with chroma of 2 or less is more than 30 inches. Plinthite ranges from 5 to 25 percent in these horizons. Up to 10 percent of some horizons is brittle, mainly in the red and yellowish brown parts.

Mantachie series

The Mantachie series consists of nearly level, deep, loamy, somewhat poorly drained, moderately permeable soils on bottom lands. These soils formed in recent loamy alluvium. The soils are flooded about once in two years. Slope is 0 to 3 percent.

A typical pedon of Mantachie loam, in Newton County; from Burkeville, 8.1 miles north along Texas Highway 87 to its intersection with Farm Road 255, 1.8 miles east along Farm Road 255, 3.8 miles north along a forest road, 0.7 mile east and 0.2 mile south along a forest trail, and 70 feet east, in forest:

A1—0 to 8 inches; dark grayish brown (10YR 4/2) loam; grayish brown (10YR 5/2) and brown (10YR 4/3) mottles; weak fine granular structure; slightly hard, friable; common fine roots; strongly acid; clear smooth boundary.

B21—8 to 15 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium light brownish gray (10YR 6/2) mottles; weak fine granular and subangular blocky structure; hard, friable; common fine roots; very strongly acid; clear wavy boundary.

B22—15 to 35 inches; light brownish gray (10YR 6/2) sandy clay loam; common medium yellowish brown (10YR 5/6) and grayish brown (10YR 5/2) mottles; weak medium subangular blocky structure; hard, friable; few fine roots; very strongly acid; gradual wavy boundary.

B23g—35 to 51 inches; light gray (10YR 6/1) clay loam; common medium yellowish brown (10YR 5/8) and red (2.5YR 4/6) mottles; weak medium subangular blocky structure; hard, firm; few fine roots; very strongly acid; gradual smooth boundary.

B24g—51 to 60 inches; light gray (10YR 6/1) fine sandy loam; common medium yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; slightly hard, friable; few small brittle areas; very strongly acid.

The solum is more than 60 inches thick.

The A horizon is 5 to 10 inches thick. It is dark grayish brown, brown, dark yellowish brown, or yellowish brown. A few pedons have thin layers of very dark grayish brown. Reaction is strongly acid or very strongly acid.

The upper part of the B horizon is dark grayish brown, grayish brown, or yellowish brown and has few to many gray mottles. The lower part of the B horizon is grayish brown, gray, or light brownish gray and has few to many brown or red mottles. The B horizon is clay loam, loam, sandy clay loam, sandy loam, or silt loam. The average clay content of the 10- to 40-inch control section is 18 to 34 percent. Reaction is strongly acid or very strongly acid.

Melhomes series

The Melhomes series consists of deep, nearly level to gently sloping, poorly drained, rapidly permeable soils that formed in thick beds of recent sandy colluvium from coastal plain sediment. These soils are on poorly defined drains and lower slopes that are saturated for most of the year. Slope is dominantly 2 percent or less.

A typical pedon of Melhomes loamy sand, in an area of Melhomes soils, frequently flooded, in Newton County; from the intersection of Texas Highway 63 and Texas Highway 87 in Burkeville, 5.3 miles north on Texas Highway 87, 2.5 miles east on a county road, and 150 feet north, in forest:

A11—0 to 4 inches; black (10YR 2/1) and very dark gray (10YR 3/1) loamy sand; weak fine granular structure; very friable, nonsticky and nonplastic; many fine, medium, and coarse roots; very strongly acid; clear smooth boundary.

A12—4 to 8 inches; very dark gray (10YR 3/1) and dark gray (10YR 4/1) loamy sand; single grained; loose, nonsticky and nonplastic; many fine, medium, and coarse roots; very strongly acid; clear smooth boundary.

Cg—8 to 65 inches; gray (10YR 5/1) sand; single grained; loose, nonsticky and nonplastic; few medium and coarse roots in the upper part; very strongly acid.

Reaction is strongly acid or very strongly acid throughout.

The A horizon is loamy fine sand, loamy sand, or sand. It is dark brown, black, very dark gray, very dark grayish brown, dark gray, dark grayish brown, or grayish brown.

The Cg horizon is gray, grayish brown, light brownish gray, or light gray. Mottles range from none to common in shades of brown, yellow, and gray. The Cg horizon is loamy sand, sand, or coarse sand. Some pedons have thin strata of sandy loam and sandy clay loam in the lower part.

Mollville series

The Mollville series consists of deep, nearly level and gently undulating, loamy, poorly drained, slowly permeable soils on terraces (fig. 17). These soils formed in thick, stratified, loamy sediment on plane to depressional areas. Slope is less than 1 percent.

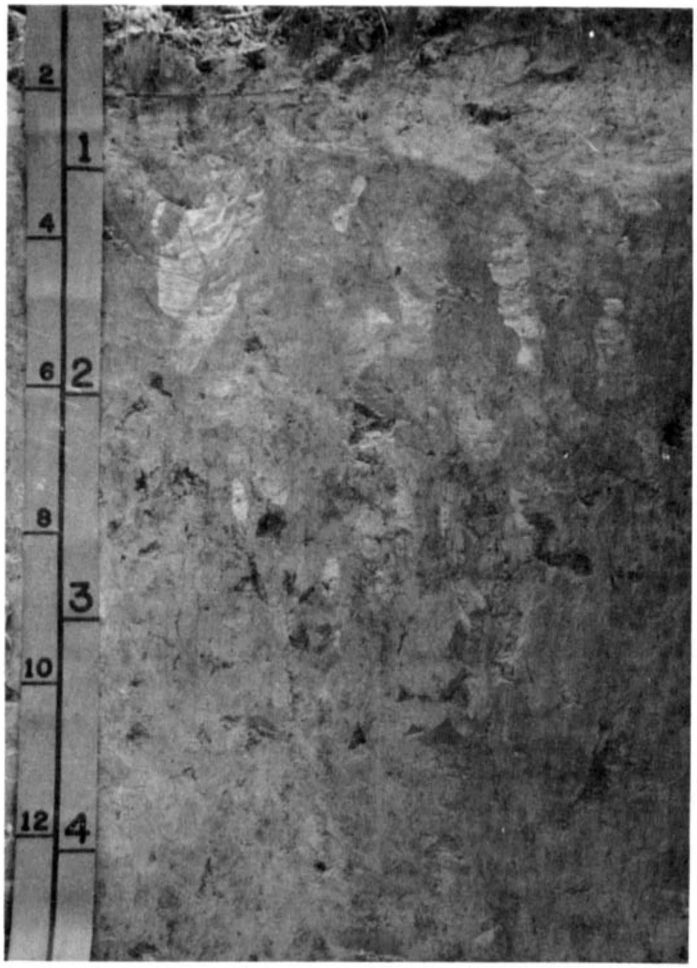


Figure 17.—A profile of Mollville very fine sandy loam showing tongues and streaks in the lower part of the profile. (The right side of the scale is in feet. Multiply the figures on the left side of the scale by 10 to determine depth in centimeters.)

A typical pedon of Mollville silt loam, in an area of Besner-Mollville complex, gently undulating, in Newton County; from the intersection of Texas Highway 87 and Farm Road 2829 near Salem, 5.1 miles south on Highway 87, 0.3 mile east on a forest road, and 250 feet north of the road, in forest:

A1—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam; moderate fine granular structure; slightly hard, very friable, slightly sticky and nonplastic; many fine roots; very strongly acid; clear wavy boundary.

A2g—4 to 12 inches; light gray (10YR 7/2) very fine sandy loam; few streaks of gray (10YR 5/1); weak fine subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common fine roots; many very fine pores; very strongly acid; clear irregular boundary.

B21t&A2g—12 to 26 inches; grayish brown (10YR 5/2) clay loam; common medium distinct strong brown (7.5YR 5/6) mottles; dark grayish brown (10YR 4/2) coatings on ped surfaces; about 20 percent of the horizon is tongues and streaks of light gray (10YR 7/2) very fine sandy loam (A2); moderate medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; few fine roots; few fine pores; very strongly acid; gradual irregular boundary.

B22tg—26 to 59 inches; grayish brown (10YR 5/2) clay loam; few medium distinct strong brown (7.5YR 5/6) and gray (10YR 6/1) mottles; interfingers of light gray (10YR 7/2) very fine sandy loam make up about 5 percent by volume; moderate coarse prismatic structure parting to moderate medium subangular blocky; hard, firm, slightly sticky and slightly plastic; few fine roots; few fine pores; clay films on faces of peds; strongly acid; clear wavy boundary.

B3g—59 to 76 inches; light brownish gray (10YR 6/2) fine sandy loam; few fine distinct yellowish brown (10YR 5/6) mottles; few streaks of light gray on vertical faces; weak coarse prismatic structure; hard, friable, nonsticky and nonplastic; medium acid.

The solum ranges from 40 to more than 70 inches in thickness.

The A1 horizon is gray, grayish brown, dark gray, dark grayish brown, or very dark grayish brown. The A2g horizon is light gray, light brownish gray, or grayish brown. Tongues or streaks of A2 material extend through the Bt horizon. Reaction of the A horizon is medium acid to very strongly acid.

The B21t horizon is light brownish gray or grayish brown and has stains and coatings of dark grayish brown. The B22tg horizon is gray, light gray, light brownish gray, or grayish brown. Mottles are in shades of brown, yellow, and red. The B2t horizon is clay loam, sandy clay loam, or silt loam. Reaction is very strongly acid to medium acid.

Mooreville series

The Mooreville series consists of deep, nearly level, loamy, moderately well drained, moderately permeable soils on bottom lands. These soils formed in recent loamy sediment. These soils are flooded about once in 3 to 5 years. Slope is less than 1 percent.

A typical pedon of Mooreville loam, in an area of Mooreville soils, occasionally flooded, in Newton County; from the spillway bridge of Toledo Bend Dam, 50 feet east to a county road, 1.5 miles north and east to an intersection, 1.0 mile south, and 75 feet east, in forest:

A11—0 to 4 inches; very dark grayish brown (10YR 3/2) loam; weak fine granular and weak medium subangular blocky structure; slightly hard, friable; many fine and medium and few coarse tree roots; strongly acid; clear smooth boundary.

A12—4 to 12 inches; brown (10YR 4/3) loam; moderate medium subangular blocky structure; slightly hard, friable; common fine and medium and few coarse tree roots; strongly acid; clear smooth boundary.

B21—12 to 20 inches; brown (10YR 4/3) loam; common fine faint gray and light brownish gray mottles; moderate medium subangular blocky structure; slightly hard, friable; common fine and medium and few coarse tree roots; very strongly acid; abrupt smooth boundary.

B22—20 to 36 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium distinct light gray (10YR 6/1) mottles; weak medium subangular blocky structure; slightly hard, very friable; few medium tree roots; very strongly acid; diffuse smooth boundary.

B23—36 to 50 inches; yellowish brown (10YR 5/6) sandy clay loam; many medium distinct light gray (10YR 6/1) mottles; weak medium subangular blocky structure; slightly hard, very friable; few medium tree roots; very strongly acid; clear smooth boundary.

B24—50 to 64 inches; yellowish brown (10YR 5/4) fine sandy loam; many medium distinct light gray (10YR 6/1) mottles; weak medium subangular blocky structure; very friable, slightly sticky; very strongly acid; abrupt smooth boundary.

C—64 to 70 inches; light brownish gray (10YR 6/2) sandy loam; many medium distinct yellowish brown (10YR 5/4) mottles; massive; very friable; very strongly acid.

The solum ranges from 40 to more than 60 inches in thickness. Reaction is strongly acid or very strongly acid.

The A horizon is brown, dark brown, very dark grayish brown, or dark grayish brown. It is loam, silt loam, sandy clay loam, or fine sandy loam.

The upper part of the B horizon is brown or yellowish brown. Mottles are few or common in shades of gray and brown. The lower part of the B horizon is brown or yellowish brown. Mottles are common or many in shades of brown and gray. The B horizon is sandy clay loam, loam, or silty clay loam.

The C horizon is mottled in shades of brown and gray. It is loam, sandy loam, clay loam, or sandy clay loam.

Newco series

The Newco series consists of deep, gently undulating to hilly, moderately well drained, slowly permeable soils on uplands. These soils formed in stratified loamy and clayey sediment. Slope ranges from 1 to 20 percent.

A typical pedon of Newco fine sandy loam, in an area of Newco-Urland association, gently undulating, in Newton County; from the intersection of U.S. Highway 190 and Farm Road 2626 1.0 mile northwest of Bon Wier, 4.9 miles northeast and north along Farm Road 2626, 0.6 mile north along a county road, 150 feet east along a forest trail, and 15 feet north, in forest:

A1—0 to 4 inches; very dark grayish brown (10YR 3/2) fine sandy loam; few stains of dark grayish brown; weak fine and medium granular structure; soft, very friable, slightly sticky and nonplastic; common fine, medium, and coarse roots; strongly acid; clear smooth boundary.

A2—4 to 10 inches; grayish brown (10YR 5/2) fine sandy loam; weak fine and medium granular structure; soft, very friable, slightly sticky and nonplastic; common fine, medium, and coarse roots; strongly acid; clear smooth boundary.

B21t—10 to 24 inches; yellowish red (5YR 5/6) clay; common medium distinct red (2.5YR 4/8) and light brown (7.5YR 6/4) mottles and few fine light gray (10YR 6/1) mottles; moderate medium subangular blocky structure; very hard, very firm, very sticky and very plastic; common fine and medium and few coarse tree roots; very strongly acid; clear smooth boundary.

B22t—24 to 29 inches; strong brown (7.5YR 5/6) clay; common medium prominent light gray (10YR 7/2) and red (2.5YR 4/8) mottles; strong medium angular blocky structure; very hard, very firm, very sticky and very plastic; common fine and medium and few coarse roots; very strongly acid; gradual smooth boundary.

B23t—29 to 48 inches; light gray (10YR 7/2) clay; common medium prominent red (2.5YR 4/8) mottles; strong medium angular blocky structure; very hard, very firm, very sticky and very plastic; few fine and medium tree roots; very strongly acid; gradual smooth boundary.

B3&C—48 to 80 inches; light gray (10YR 7/2) sandy clay loam; common medium prominent red (2.5YR 4/8) mottles; thin layers of silty clay, clay, and fine sandy loam; moderate medium angular blocky structure with layers of platy structure; slightly hard, firm, slightly sticky and slightly plastic; very strongly acid.

The solum ranges from 40 to more than 60 inches in thickness. Base saturation ranges from 10 to 30 percent.

The A1 horizon is very dark grayish brown, dark grayish brown, dark brown, and brown. The A2 horizon is grayish brown, brown, and pale brown. Reaction is medium acid to very strongly acid.

The B21t and B22t horizons are yellowish red, red, reddish brown, and strong brown. Mottles in shades of red, yellow, and gray range from none to common. The B23t horizon is light gray, light brownish gray, and gray. Mottles in shades of red, yellow, and brown range from none to common. The Bt horizon ranges from clay to silty clay. Clay content is 40 to 60 percent. Reaction is strongly acid or very strongly acid.

The B3 and C horizons are light gray, light brownish gray, and gray. Mottles in shades of red, yellow, and brown range from none to common. The platy layers range from fine sandy loam to clay with layers of shale and sandstone. Reaction is strongly acid or very strongly acid.

Nikful series

The Nikful series consists of deep, nearly level to sloping, loamy, somewhat poorly drained, very slowly permeable soils on uplands. These soils formed in weakly consolidated, acid, tuffaceous sandstone and siltstone. Slope ranges from 0 to 8 percent.

A typical pedon of Nikful fine sandy loam, 0 to 8 percent slopes, in Jasper County; from Jasper, 9 miles north along U.S. Highway 96 to its intersection with Farm Road 255, 4.5 miles west on Farm Road 255 to its intersection with Twin Dikes Park Road, and 300 feet west of the intersection:

A1—0 to 8 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak blocky and granular structure; soft, very friable; common fine roots; strongly acid; clear smooth boundary.

A2—8 to 18 inches; light yellowish brown (10YR 6/4) fine sandy loam; stains of dark grayish brown (10YR 4/2); weak blocky structure; soft, very friable; common fine roots; medium acid; clear smooth boundary.

B21t—18 to 23 inches; light yellowish brown (10YR 6/4) sandy clay loam; many medium distinct yellowish brown (10YR 5/8) mottles and few medium distinct light brownish gray (10YR 6/2) mottles; moderate medium blocky structure; firm, very hard, very sticky and plastic; few clay films; common fine roots; medium acid; clear smooth boundary.

IIB22tg—23 to 33 inches; grayish brown (10YR 5/2) clay; many medium prominent red (2.5YR 4/6, 4/8) mottles and few fine distinct strong brown (7.5YR 5/6) mottles; moderate medium blocky structure; extremely hard, very firm, very sticky and very plastic; few apparent clay films; few fine roots; medium acid; clear smooth boundary.

IIB23tg—33 to 40 inches; light brownish gray (10YR 6/2) clay; common coarse prominent red (2.5YR 4/6) mottles; massive; extremely hard, very firm, very sticky and very plastic; very strongly acid; diffuse boundary.

IIB3&C40 to 48 inches; light brownish gray (10YR 6/2) clay and weakly consolidated volcanic siltstone; few coarse prominent red (2.5YR 4/6) mottles and few stains of brown (10YR 5/3); fragments of massive siltstone bedrock are surrounded by clay that has weak blocky structure; extremely hard, very firm, slightly sticky and slightly plastic; extremely acid; diffuse wavy boundary.

Cr—48 to 60 inches; very pale brown (10YR 7/3) weakly consolidated tuffaceous siltstone; few streaks of brown (10YR 5/3); massive; hardness less than 3 on Moh's scale; extremely acid.

The solum ranges from 40 to 60 inches in thickness. Reaction ranges from medium acid to extremely acid. Base saturation ranges from 35 to 60 percent.

Thickness of the A horizon ranges from 15 to 25 inches. The A horizon is dark grayish brown, grayish brown, or brown. The A2 horizon is brown, yellowish brown, pale brown, or light yellowish brown.

The B21t horizon is pale brown, light yellowish brown, brownish yellow, yellowish brown, strong brown, or brown. Mottles are few or common in shades of gray, red, and brown. Texture is sandy clay loam or clay loam. The IIB2tg horizon is gray, grayish brown, light brownish gray, or light gray. Mottles are few or common in shades of red, yellow, and brown. The IIB2tg horizon is clay loam or clay.

The Cr horizon is light brownish gray, pale brown, light gray, or very pale brown. It is weakly consolidated, tuffaceous sandstone and siltstone that is bentonitic. However, it contains volcanic ash, volcanic glass, and other pyroclastic materials.

Niwana series

The Niwana series consists of deep, gently undulating, loamy, moderately well drained soils on uplands.

Permeability is moderately slow. These soils formed in thick beds of unconsolidated loamy sediment that has been modified by wind. These soils are on mounds that are 50 to 200 feet in diameter and 1 foot to 3 feet above the intermound areas. Slope ranges from 0 to 5 percent.

A typical pedon of Niwana fine sandy loam, in an area of Niwana-Kirbyville association, gently undulating, in Jasper County; from the intersection of U.S. Highway 96 and Farm Road 82 at Kirbyville, 3.3 miles west on Farm Road 82, 0.9 mile south on a county road, 2.7 miles southwest and west on a forest road, 0.5 mile northeast on a forest trail, and 150 feet east, on a mound:

A1—0 to 4 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; soft, very friable, slightly sticky and nonplastic; many fine and medium roots; medium acid; clear smooth boundary.

A2—4 to 25 inches; pale brown (10YR 6/3) fine sandy loam; weak fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; few fine, medium, and coarse roots; strongly acid; clear smooth boundary.

B21t&A2—25 to 40 inches; brownish yellow (10YR 6/6) loam (B21t); about 15 percent of the horizon is tongues of very pale brown (10YR 7/4) (A2); weak medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; few coarse roots; very strongly acid; patchy clay films on faces of peds; gradual irregular boundary.

B22t&A2—40 to 62 inches; brownish yellow (10YR 6/8) sandy clay loam (B22t); about 15 percent of the horizon is tongues of light gray (10YR 7/2) (A2); moderate medium subangular blocky structure; hard, firm, sticky and slightly plastic; few coarse roots; patchy clay films on faces of peds; very strongly acid; gradual irregular boundary.

B23t&A2—62 to 75 inches; brownish yellow (10YR 6/6) sandy clay loam (B23t); about 5 percent of the horizon is interfingers of light gray (10YR 7/2) (A2); moderate medium subangular blocky structure; hard, firm, sticky and slightly plastic; very strongly acid.

The solum is more than 60 inches thick. Base saturation ranges from 15 to 35 percent at a depth of 72 inches.

The A1 horizon is brown, dark grayish brown, or very dark grayish brown. The A2 horizon is brown, pale brown, yellowish brown, or light yellowish brown. Reaction of the A horizon is medium acid or strongly acid.

The upper part of the B&A horizon is fine sandy loam and loam. Clay content is less than 18 percent. The Bt material is reddish yellow, brownish yellow, or yellowish brown. The tongues of A2 material are light brownish gray, pale brown, or very pale brown. In some pedons, mottles range from few to common in shades of yellow and brown. Reaction is strongly acid or very strongly acid. The lower part of the B&A horizon is loam or sandy clay loam. Clay content ranges from 18 to 30 percent. The Bt material is brownish yellow or reddish yellow. The tongues of A2 material are light brownish gray, pale brown, light gray, or very pale brown. Mottles range from few to common in shades of brown, yellow, and gray. The amount of A2 material decreases as depth increases. Plinthite and ironstone nodules comprise up to 3 percent of the lower part of the B&A horizon. In some pedons, brittle bodies make up to 20 percent of the lower part of the B&A horizon. Reaction is strongly acid or very strongly acid.

Ochlockonee series

The Ochlockonee series consists of deep, nearly level, loamy, well drained, moderately permeable soils on bottom lands. These soils formed in recent loamy alluvium. These soils are flooded about once in 3 to 5 years. Slope is less than 1 percent.

A typical pedon of Ochlockonee fine sandy loam, in an area of Ochlockonee soils, occasionally flooded, in Jasper County; from the intersection of U.S. Highway 96 and Texas Highway 63 in Jasper, 10.3 miles northwest along Texas Highway 63, 0.3 mile west, 2.7 miles south and west, 0.1 mile north along a forest road, and 50 feet west, in forest:

A11—0 to 7 inches; dark brown (10YR 4/3) fine sandy loam; weak medium granular structure; very friable; slightly acid; clear smooth boundary.

A12—7 to 21 inches; brown (10YR 5/3) fine sandy loam; common medium faint dark brown (10YR 4/3) mottles; massive; very friable; strongly acid; clear smooth boundary.

C1—21 to 29 inches; mottled brown (10YR 5/3) and dark brown (10YR 4/3) loam; massive; very friable; strongly acid; clear smooth boundary.

C2—29 to 45 inches; dark yellowish brown (10YR 4/4) loam; common medium faint brown (10YR 5/3) mottles; massive; very friable; very strongly acid; clear smooth boundary.

C3—45 to 52 inches; strong brown (7.5YR 5/6) loam; common medium distinct pale brown (10YR 6/3) mottles; massive; very friable; very strongly acid; clear smooth boundary.

C4—52 to 60 inches; pale brown (10YR 6/3) fine sandy loam; common medium distinct brown (7.5YR 5/4) mottles; massive; very friable; strongly acid.

Reaction of the A horizon is very strongly acid to slightly acid. The C horizon is very strongly acid or strongly acid. Most pedons have strata of contrasting texture and organic matter content.

The A horizon is dark brown, very dark grayish brown, dark grayish brown, or brown. If chroma and value are 3 or less, the A horizon is less than 7 inches thick. The A horizon is fine sandy loam or loamy fine sand.

The C horizon is strong brown, brown, yellowish brown, pale brown, light yellowish brown, dark yellowish brown, or brownish yellow. Some pedons have mottles of brown, yellow, or gray below a depth of 20 inches. The C horizon is mostly fine sandy loam or loam with strata ranging from loamy sand to silty clay loam. The 10- to 40-inch control section contains less than 18 percent clay and more than 15 percent fine sand to coarse sand.

Pinetucky series

The Pinetucky series consists of deep, gently undulating and undulating, loamy, moderately well drained soils on uplands. Permeability is moderately slow. These soils formed in loamy coastal sediment. Slope ranges from 1 to 8 percent.

A typical pedon of Pinetucky fine sandy loam, in an area of Pinetucky-Doucette association undulating, in Newton County; from the intersection of U.S. Highway 190 and Texas Highway 87 in Newton, 4.1 miles northeast along Texas Highway 87, 1.2 miles east on Farm Road 1414, 800 feet southeast along a forest road to a gate, 100 feet south, and 50 feet west, in forest:

A1—0 to 8 inches; grayish brown (10YR 5/2) fine sandy loam; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common fine and few medium roots; very strongly acid; clear smooth boundary.

A2—8 to 13 inches; yellowish brown (10YR 5/6) fine sandy loam; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common fine and few medium roots; very strongly acid; clear smooth boundary.

B21t—13 to 27 inches; strong brown (7.5YR 5/6) sandy clay loam; few medium faint strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; patchy clay films on faces of peds; few fine and medium roots; few fine pores; very strongly acid; clear wavy boundary.

B22t—27 to 48 inches; yellowish brown (10YR 5/8) sandy clay loam; moderate medium subangular blocky structure; hard, firm, sticky and plastic; few fine pores; patchy clay films on faces of peds; very strongly acid; gradual wavy boundary.

B23t—48 to 65 inches; yellowish brown (10YR 5/8) sandy clay loam; many medium and coarse prominent red (2.5YR 4/6) and yellowish red (5YR 4/8) mottles and many fine and medium distinct light gray (10YR 7/2) mottles; moderate medium subangular blocky structure; hard, firm, sticky and plastic; few fine pores; few thin patches of clay films on faces of peds; plinthite makes up about 10 percent by volume of the horizon; very strongly acid; clear smooth boundary.

B24t—65 to 80 inches; brownish yellow (10YR 6/6) sandy clay loam; many medium and coarse prominent red (2.5YR 4/8) and yellowish red (5YR 4/8) mottles and common fine and medium distinct light gray (10YR 7/2) mottles; weak medium subangular blocky structure; hard, firm, sticky and plastic; few apparent clay films; plinthite makes up about 2 percent by volume of the horizon; very strongly acid.

The solum is more than 60 inches thick. Depth to a horizon that contains more than 5 percent plinthite is 25 to 50 inches. Strongly cemented to indurated iron oxide concretions up to 2 centimeters in diameter make up 0 to 10 percent of the A horizon and 0 to 5 percent of the Bt horizon. Base saturation at 50 inches below the top of the Bt horizon ranges from 5 to 20 percent. CEC ranges from 8 to 15 milliequivalents per 100 grams of soil.

The A horizon is grayish brown, dark grayish brown, or brown. The A2 horizon is grayish brown, brown, yellowish brown, pale brown, light yellowish brown, or brownish yellow. Reaction is medium acid to very strongly acid.

The B21t and B22t horizons are strong brown, yellowish brown, or brownish yellow. Mottles range from none to many in shades of red, brown, and yellow. The B23t and B24t horizons have colors similar to those of the B21t and B22t horizons and, in addition, contain few to many mottles in shades of red, brown, yellow, and gray. Some subhorizons in the B2t horizon have 5 to 20 percent plinthite. The B2t horizon is sandy clay loam or clay loam throughout, and clay content ranges from 20 to 35 percent. The B2t horizon is strongly acid or very strongly acid.

Rayburn series

The Rayburn series consists of deep, gently undulating to hilly, loamy, moderately well drained, very slowly permeable soils on uplands. These soils formed in weakly consolidated, acid, tuffaceous sandstone and siltstone. Slope ranges from 1 to 20 percent.

A typical pedon of Rayburn fine sandy loam, in an area of Rayburn-Kisatchie association, hilly, in Jasper County; from the intersection of U.S. Highway 96 and Texas Highway 63 in Jasper, 10.1 miles northwest along Texas Highway 63, 3.2 miles north along River Ridge Road, 2.4 miles northeast along a forest road to an intersection, 1.7 miles south and west along a forest road, 300 feet north along a forest trail, and 50 feet east, in forest:

A1—0 to 5 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak medium granular structure; very friable, soft; common fine roots; strongly acid; clear smooth boundary.

A2—5 to 7 inches; dark grayish brown (10YR 4/2) fine sandy loam; common medium faint brown (10YR 4/3) and grayish brown (10YR 5/2) mottles; weak fine and medium granular structure; very friable, soft; common fine roots; strongly acid; abrupt smooth boundary.

B21t—7 to 16 inches; red (2.5YR 4/6) clay; common medium prominent light brownish gray (10YR 6/2) mottles; moderate medium angular blocky structure; very firm, extremely hard, very plastic and sticky; few pressure faces 1 to 2 inches across; few apparent clay films; common fine roots; very strongly acid; gradual smooth boundary.

B22t—16 to 27 inches; mottled strong brown (7.5YR 5/6), light brownish gray (10YR 6/2), and red (2.5YR 4/6) clay; moderate fine and medium angular blocky structure; very firm, extremely hard, very plastic and sticky; few fine pressure faces; few thin clay films; few fine roots; very strongly acid; gradual wavy boundary.

B23t—27 to 45 inches; mottled pale brown (10YR 6/3), strong brown (7.5YR 5/6), and pale olive (5Y 6/3) clay; moderate fine and medium angular blocky structure; very firm, extremely hard, very plastic and sticky; few fine pressure faces and slickensides; few apparent clay films; few fine roots; very strongly acid; gradual smooth boundary.

B3&C—45 to 55 inches; pale olive (5Y 6/3) clay; common medium distinct olive yellow (5Y 6/8) mottles; weak fine subangular blocky structure; very firm, extremely hard, plastic; few fine fragments of unconsolidated tuffaceous sandstone; very strongly acid; gradual smooth boundary.

Cr—55 to 65 inches; light gray (2.5YR 7/2) weakly consolidated tuffaceous sandstone; few medium distinct olive yellow (2.5Y 6/8) mottles; massive; very strongly acid.

The solum ranges from 40 to 60 inches in thickness. Base saturation at the paralithic contact is 35 to 60 percent. The COLE is .09 to .14 in the Bt horizon. When dry, these soils have cracks 1 centimeter or more wide in the upper part of the subsoil.

The A horizon is very strongly acid to medium acid. It is 4 to 15 inches thick. The A1 horizon is dark grayish brown, very dark grayish brown, very dark brown, brown, dark brown, grayish brown, gray, or dark gray. The A2 horizon, if present, is dark grayish brown, grayish brown, brown, or pale brown. Where moist value is less than 3.5, the A horizon is less than 6 inches thick.

The B21t horizon is reddish brown, yellowish red, or red. A few mottles of light brownish gray are in most pedons. The B22t, B23t, and B3 horizons are mostly strong brown, grayish brown, pale brown, light brownish gray, light olive gray, olive, or pale olive. There are common prominent red, reddish brown, and yellowish red mottles in the upper part and light gray and light yellowish brown mottles in the lower part. The Bt horizon is clay or silty clay. Clay content of the upper 20 inches averages between 40 and 60 percent, but the B21t horizon can have up to 70 percent clay. The Bt horizon ranges from extremely acid to strongly acid.

The Cr horizon is mostly weakly consolidated, tuffaceous sandstone that is bentonitic. However, it contains volcanic ash, volcanic glass, and other pyroclastic materials. It ranges from extremely acid to medium acid.

Redco series

The Redco series consists of deep, gently undulating, clayey, poorly drained soils on uplands. Permeability is very slow. These soils formed in acid to alkaline, unconsolidated, clayey coastal plain sediment. Slope ranges from 0 to 5 percent.

The Redco soils in this survey area are considered a taxadjunct because they are more acid than is typical for the series. However, this difference does not significantly affect use and behavior.

A typical pedon of Redco clay, in an area of Redco-Woodville association, gently undulating, in Newton County; from the junction of Texas Highway 63 at U.S. Highway 190 east of Jasper, 7.0 miles east on Texas Highway 63, 2.0 miles south on a county road to Huff Creek Community, 2.3 miles east on a county road, and 180 feet south, in forest:

A1—0 to 5 inches; dark brown (10YR 4/3) clay; weak medium blocky structure; very hard, very firm, very sticky and very plastic; many fine roots; strongly acid; clear wavy boundary.

AC1—5 to 11 inches; yellowish brown (10YR 5/4) clay; common fine light brownish gray (10YR 6/2) and red (2.5YR 4/8) mottles; moderate medium angular blocky structure; extremely hard, very firm, very sticky and very plastic; few wormcasts; very strongly acid; clear wavy boundary.

AC2—11 to 19 inches; mottled light brownish gray (10YR 6/2), red (2.5YR 4/8), and strong brown (7.5YR 5/6) clay; strong medium angular blocky structure; extremely hard, very firm, very sticky and very plastic; very strongly acid; gradual wavy boundary.

AC3—19 to 27 inches; light brownish gray (10YR 6/2) and strong brown (7.5YR 5/6) clay; many medium prominent red (2.5YR 4/6) mottles; strong medium angular blocky structure; extremely hard, very firm, very sticky and very plastic; many pressure faces; few small and medium intersecting slickensides; few black concretions; very strongly acid; clear wavy boundary.

AC4—27 to 49 inches; gray (10YR 6/1) clay; common medium prominent red (2.5YR 4/8) and reddish yellow (7.5YR 6/8) mottles; massive; extremely hard, very firm, very sticky and very plastic; many large intersecting slickensides; very strongly acid; gradual wavy boundary.

AC5—49 to 65 inches; gray (N 6/0) clay; many medium prominent strong brown (7.5YR 5/6, 5/8) mottles and few medium prominent red (2.5YR 4/6) mottles; massive; extremely hard, very firm, very sticky and very plastic; many large intersecting slickensides; very strongly acid.

Gilgai microrelief is evident in undisturbed areas. It is 8 to 15 feet from the center of a microknoll to the center of microdepression. Highs are 4 to 12 inches above the lows. Depth to intersecting slickensides ranges from 19 to 49 inches. Solum thickness ranges from 40 to 60 inches. Clay content ranges from 60 to 90 percent.

The A horizon is 1 to 7 inches thick. It is brown, grayish brown, dark grayish brown, or very dark grayish brown. Mottles are in shades of yellow, brown, or gray. Reaction is medium acid to very strongly acid.

The AC1 horizon is brown, strong brown, pale brown, brownish yellow, yellowish brown, or dark yellowish brown. The AC2 horizon is light gray, light brownish gray, or gray. Mottles are in shades of gray, brown, and red. The AC horizon is clay or silty clay. A few black concretions are in some pedons. Few to common pitted concretions and seams of calcium carbonate are in some pedons below a depth of 50 inches. Reaction is very strongly acid to medium acid in the AC horizon except for those pedons that have calcium carbonate below a depth of 50 inches. These lower layers are moderately alkaline.

The C horizon, if present, is layered clay, marl, or shale. Reaction ranges from medium acid to moderately alkaline.

Rogan series

The Rogan series consists of deep, gently undulating, loamy, moderately well drained soils on uplands. Permeability is moderately slow. These soils formed in loamy coastal plain sediment (fig. 18). Slope ranges from 1 to 5 percent.

A typical pedon of Rogan gravelly fine sandy loam, in an area of Rogan-Pinetucky association, gently undulating, in Jasper County; from the intersection of U.S. Highway 96 and U.S. Highway 190 in Jasper, 12.2 miles south along U.S. Highway 96, 1.3 miles northeast and east along a county road, 0.2 mile south along a forest road, and 200 feet east, in forest:

A1—0 to 8 inches; grayish brown (10YR 5/2) gravelly fine sandy loam; weak fine granular structure; soft, very friable, slightly sticky and nonplastic; many fine and medium roots; 25 percent by volume concretions of ironstone up to 2 centimeters in diameter; medium acid; clear smooth boundary.

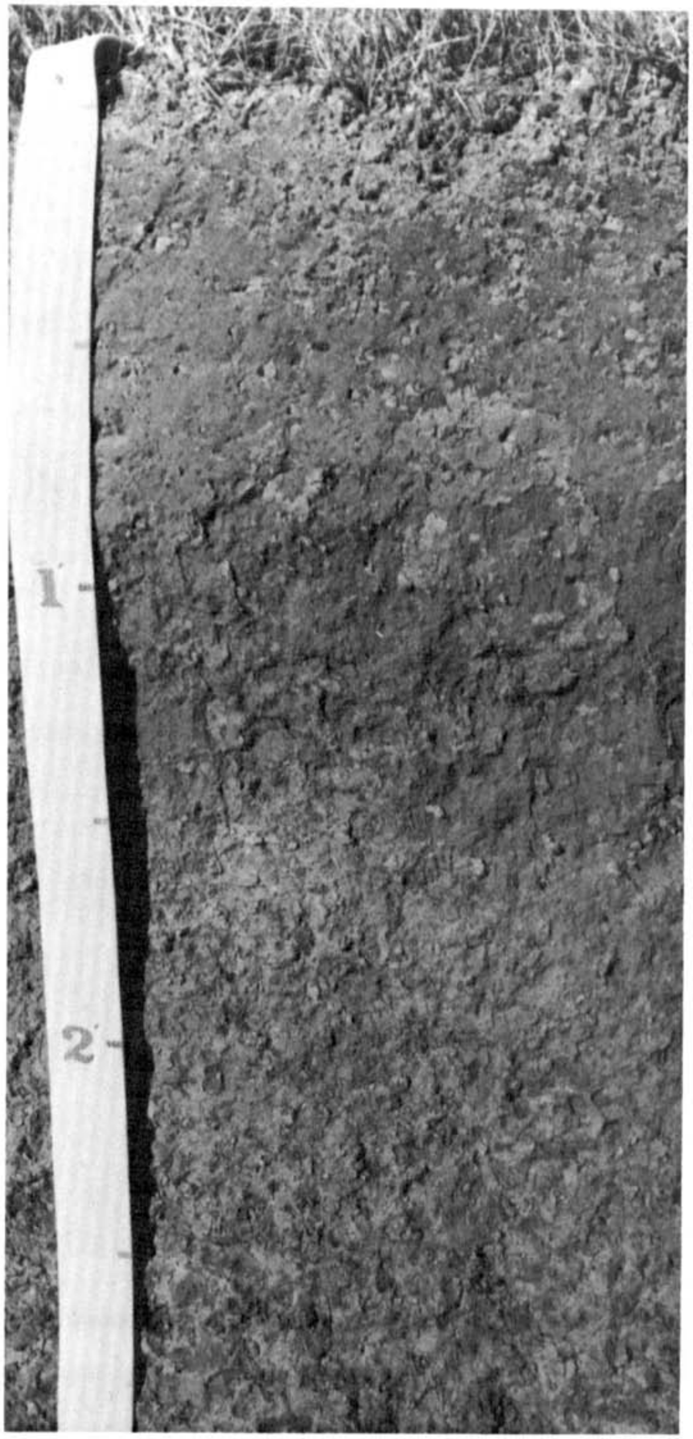


Figure 18.—A profile of Rogan gravelly fine sandy loam. Note the ironstone gravel in the surface layer. (The scale is in feet.)

A2—8 to 16 inches; pale brown (10YR 6/3) gravelly fine sandy loam; weak fine granular structure; soft, very friable, slightly sticky and nonplastic; many fine and medium roots; 25 percent by volume concretions of ironstone up to 2 centimeters in diameter; medium acid; clear smooth boundary.

B21t—16 to 26 inches; strong brown (7.5YR 5/6) gravelly sandy clay loam; moderate medium subangular blocky structure; slightly hard, friable, sticky and nonplastic; common fine pores; few patchy clay films; 30 percent by volume concretions of ironstone up to 2 centimeters in diameter; strongly acid; gradual smooth boundary.

B22t—26 to 36 inches; strong brown (7.5YR 5/6) sandy clay loam; moderate medium subangular blocky structure; hard, firm, sticky and plastic; few fine pores; common patchy clay films; 5 percent by volume concretions of ironstone up to 2 centimeters in diameter; strongly acid; gradual smooth boundary.

B23t—36 to 52 inches; strong brown (7.5YR 5/6) sandy clay loam; common medium prominent red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; hard, firm, sticky and plastic; few fine pores; common patchy clay films; plinthite makes up about 8 percent by volume of the horizon; strongly acid; gradual smooth boundary.

B24t—52 to 65 inches; strong brown (7.5YR 5/6) sandy clay loam; many medium prominent light brownish gray (10YR 6/2) and red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; hard, firm, sticky and plastic; few patchy clay films; plinthite makes up about 15 percent by volume of the horizon; strongly acid.

The solum ranges from 60 to more than 80 inches in thickness. Depth to horizons that contain more than 5 percent plinthite is 25 to 58 inches. Strongly cemented to indurated concretions of iron oxide less than 2 centimeters in diameter make up from 15 to 35 percent of the A horizon, from 10 to 35 percent of the B21t horizon, and from 0 to 10 percent of the lower Bt horizons.

The A1 horizon is dark grayish brown, grayish brown, or brown. The A2 horizon is light brown, brown, yellowish brown, pale brown, light yellowish brown, or very pale brown. Reaction is strongly acid or medium acid.

The B21t and B22t horizons are yellowish brown or strong brown. Mottles range from none to many in shades of red, brown, and yellow. The B23t and B24t horizons have colors similar to those of the B21t and B22t horizons in addition to brownish yellow or reddish yellow. Mottles are in shades of red, yellow, brown, and gray. The B23t and B24t horizons contain 5 to 20 percent plinthite. The B21t horizon is gravelly sandy clay loam, and the lower B2t horizons are sandy clay loam or clay loam and have clay content ranging from 20 to 35 percent. The B2t horizon is very strongly acid or strongly acid.

Shankler series

The Shankler series consists of deep, undulating to hilly, sandy, well drained to somewhat excessively drained, moderately permeable soils on uplands. These soils formed in sandy coastal plain sediment. Slope ranges from 1 to 20 percent.

A typical pedon of Shankler loamy fine sand, in an area of Shankler-Boykin association, hilly, in Newton County; from the intersection of U.S. Highway 190 and Farm Road 2626 near Bon Wier, 4.5 miles north on Farm Road 2626, 1.25 miles east and 0.6 mile north on a county road, and 100 feet northwest, in forest:

A11—0 to 5 inches; dark brown (10YR 3/3) loamy fine sand; weak fine granular structure; soft, very friable, nonsticky and nonplastic; common fine roots; strongly acid; gradual smooth boundary.

A12—5 to 12 inches; brown (10YR 4/3) loamy fine sand; single grained; soft, loose, nonsticky and nonplastic; common fine and medium roots; strongly acid; gradual smooth boundary.

A21—12 to 29 inches; light yellowish brown (10YR 6/4) loamy fine sand; single grained; soft, loose, nonsticky and nonplastic; common fine and medium roots; very strongly acid; diffuse smooth boundary.

A22—29 to 43 inches; very pale brown (10YR 7/4) loamy fine sand; single grained; soft, loose, nonsticky and nonplastic; few fine roots; very strongly acid; abrupt smooth boundary.

B21t—43 to 65 inches; red (2.5YR 5/8) sandy clay loam; weak coarse prismatic and moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few patchy clay films on faces of peds; few fine roots; very strongly acid; diffuse smooth boundary.

B22t—65 to 80 inches; yellowish red (5YR 5/6) sandy loam; weak coarse prismatic structure; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; very strongly acid.

Solum thickness is greater than 80 inches. Thickness of the A horizon ranges from 40 to 60 inches. Base saturation at 72 inches ranges from 8 to 25 percent.

The A1 horizon is very dark grayish brown, dark brown, dark grayish brown, grayish brown, or brown. If value is 3, the horizon is less than 6 inches thick. The A2 horizon is brown, yellowish brown, pale brown, light yellowish brown, or very pale brown. Reaction of the A horizon ranges from slightly acid to very strongly acid.

The Bt horizon is reddish yellow, red, yellowish red, strong brown, light yellowish brown, brownish yellow, or yellowish brown. Brown and red mottles range from none to common. The horizon is sandy loam, fine sandy loam, or sandy clay loam. The average clay content in the upper 20 inches of the Bt horizon ranges from 18 to 35 percent. The Bt horizon is strongly acid or very strongly acid. Plinthite in the lower part of the Bt horizon ranges from 0 to about 5 percent.

Spurger series

The Spurger series consists of deep, gently undulating, loamy, moderately well drained, slowly permeable soils on terraces. The soils formed in clayey and sandy alluvium. Slope ranges from 0 to 3 percent.

A typical pedon of Spurger loam, in an area of Spurger-Mollville association, gently undulating, in Newton County; from the intersection of U.S. Highway 96 and Farm Road 82 at Kirbyville, 5.7 miles east on Farm Road 82, 3.2 miles south on Texas Highway 87, 3.0 miles east and 0.4 mile south on a county road, and 100 feet west, in forest:

A1—0 to 5 inches; very dark grayish brown (10YR 3/2) loam; many coarse faint dark grayish brown (10YR 4/2) mottles; weak fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine and medium roots and few coarse roots; very strongly acid; clear smooth boundary.

A2—5 to 9 inches; brown (10YR 5/3) loam; many coarse faint pale brown (10YR 6/3) and few medium faint dark grayish brown (10YR 4/2) mottles; weak fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine and medium roots and few coarse roots; very strongly acid; clear smooth boundary.

B21t—9 to 25 inches; dark red (2.5YR 3/6) clay; few fine distinct strong brown (7.5YR 5/6) and light brownish gray (10YR 6/2) mottles in the lower part; moderate medium subangular blocky structure; very hard, very firm, sticky and plastic; few medium and coarse roots; thin patchy clay films on faces of peds; very strongly acid; gradual wavy boundary.

B22t—25 to 36 inches; red (2.5 4/6) clay; common medium distinct strong brown (7.5YR 5/6) mottles and few medium distinct light brownish gray (10YR 6/2) mottles; moderate medium angular and subangular blocky structure; very hard, very firm, sticky and plastic; few medium and coarse roots; thin patchy clay films on faces of peds; very strongly acid; gradual smooth boundary.

B23t—36 to 43 inches; yellowish red (5YR 5/6) sandy clay loam; few fine distinct red (2.5YR 4/6) mottles and common medium distinct light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; hard, very firm, sticky and plastic; thin patchy clay films on faces of peds; very strongly acid; gradual smooth boundary.

B3—43 to 65 inches; mottled yellowish red (5YR 5/8) and strong brown (7.5YR 5/6) sandy clay loam; few medium distinct light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; very strongly acid; gradual smooth boundary.

C—65 to 80 inches; brownish yellow (10YR 6/6) sand; few medium distinct mottles of strong brown (7.5YR 5/8); single grained; loose; very strongly acid.

The solum ranges from 40 to 70 inches in thickness.

The A horizon is loam or fine sandy loam. Reaction is strongly acid or very strongly acid, except where the surface layer has been limed. Base saturation ranges from 35 to 60 percent. The A1 horizon is dark grayish brown or very dark grayish brown. If the value is less than 3.5, the thickness of the horizon is less than 7 inches. The A2 horizon is dark grayish brown, grayish brown, brown, yellowish brown, pale brown, or light yellowish brown.

The B21t and B22t horizons are clay or clay loam. These horizons are dark red, red, reddish brown, yellowish red, or strong brown. Mottles with chroma of 2 or less are in the upper 10 inches of the argillic horizon. The B23t horizon is clay loam, sandy clay loam, or loam. The B23t horizon has colors similar to those of the B21t and B22t horizons, but in some pedons it has colors mostly in shades of gray. Mottles in shades of gray, brown, yellow, and red are throughout the horizon. Some pedons have bleached sand and silt coatings or interfingerings of A'2 material in the B23t horizon.

The B3 and C horizons are strong brown, reddish yellow, yellowish red, light brownish gray, grayish brown, very pale brown, or brownish yellow. Mottles are in shades of gray, brown, yellow, and red. The horizons are fine sandy loam, sandy loam, loamy fine sand, or sand. Thin strata of clay loam, sandy clay loam, or loam are in some pedons.

Stringtown series

The Stringtown series consists of deep, gently sloping to hilly, loamy, well drained, moderately permeable soils on uplands. These soils formed in weakly consolidated, loamy sediment on the coastal plain (fig. 19). Slope ranges from 1 to 20 percent.

A typical pedon of Stringtown fine sandy loam, in an area of Stringtown-Bonwier association, hilly, in Newton County; from Newton 4.1 miles northeast on Texas Highway 87, 4.6 miles east on Farm Road 1414, 2.15 miles southeast on a county road, and 120 feet north, in forest:

A1—0 to 5 inches; dark grayish brown (10YR 4/2) fine sandy loam; few stains of very dark grayish brown (10YR 3/2); weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine, medium, and coarse roots; few ironstone pebbles up to 1/2 inch in diameter; strongly acid; clear smooth boundary.

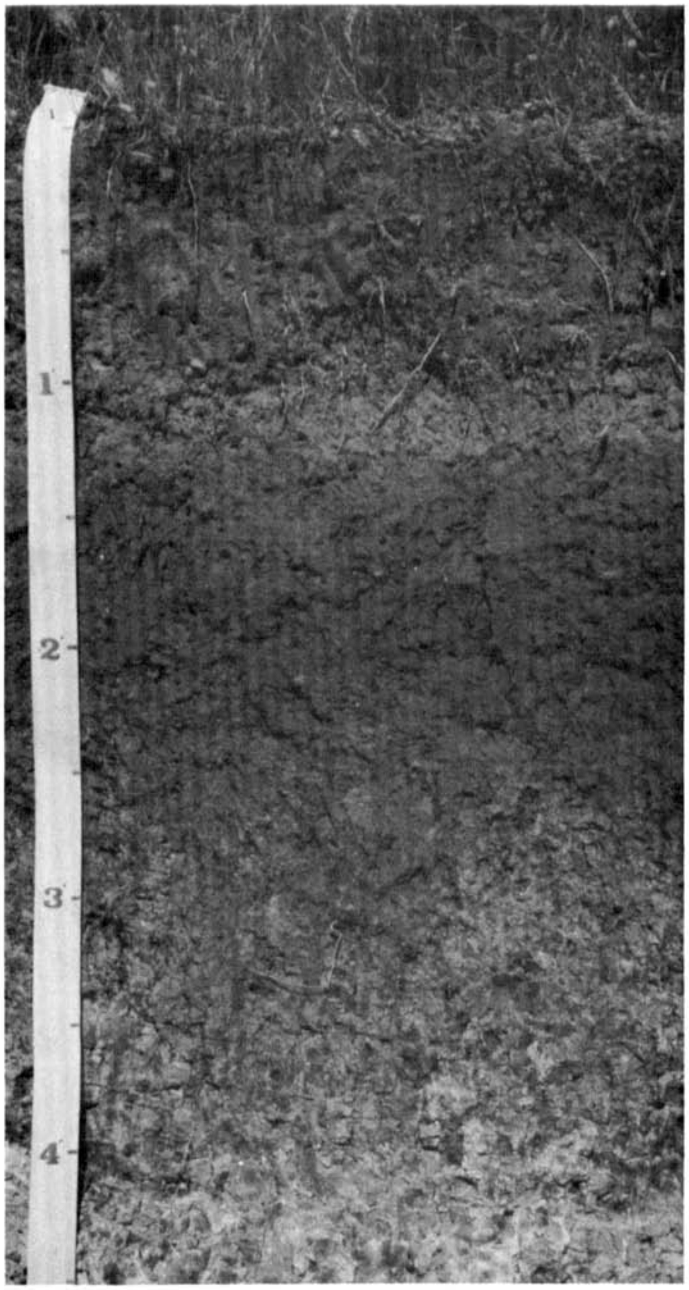


Figure 19.—A profile of Stringtown fine sandy loam showing the sandy clay loam subsoil. Below a depth of 45 inches are shale, soft sandstone, and sandy clay loam.

A2—5 to 11 inches; light yellowish brown (10YR 6/4) fine sandy loam; few stains of dark grayish brown (10YR 4/2); weak fine granular structure; soft, very friable, nonsticky and nonplastic; few fine, medium, and coarse roots; about 10 percent by volume ironstone gravel up to 1/2 inch in diameter; strongly acid; clear smooth boundary.

B21t—11 to 26 inches; strong brown (7.5YR 5/8) sandy clay loam; moderate medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few medium and coarse roots; about 10 percent by volume ironstone gravel; very strongly acid; gradual wavy boundary.

B22t—26 to 34 inches; reddish yellow (7.5YR 6/8) sandy clay loam; common medium prominent red (2.5YR 5/8) mottles; moderate medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; few coarse tree roots; very strongly acid; gradual wavy boundary.

B23t—34 to 45 inches; reddish yellow (7.5YR 6/8) sandy clay loam; common medium prominent red (2.5YR 4/8) mottles; few fine light gray mottles; moderate medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; about 5 percent by volume plinthite; very strongly acid; gradual wavy boundary.

B3—45 to 54 inches; mottled reddish yellow (7.5YR 6/8), red (2.5YR 4/8), and light gray (10YR 7/1) sandy clay loam; weak medium subangular blocky structure; very hard, firm, slightly sticky and slightly plastic; few fragments of purple and white shale; extremely acid; diffuse irregular boundary.

Cr—54 to 80 inches; thinly bedded light gray (10YR 7/1), reddish yellow (7.5YR 6/8), and red (2.5YR 4/8, 2.5YR 4/6, 10R 4/8) sandy clay loam, shale, and soft sandstone; strata of shale 1/4 to 2 inches thick; weakly cemented sandstone; extremely acid.

The solum ranges from 40 to 60 inches in thickness. Ironstone pebbles and angular fragments make up 1 to 15 percent by volume of the A horizon. A few ironstone cobbles up to 6 inches in diameter are in some pedons. Plinthite makes up 1 to 5 percent by volume of the lower part of the Bt horizon. Base saturation ranges from 25 to 35 percent.

The A horizon ranges from slightly acid to very strongly acid. The A1 horizon is grayish brown, dark grayish brown, very dark grayish brown, or brown. The A2 horizon is brown, pale brown, or light yellowish brown.

The Bt horizon is sandy clay loam or clay loam. Clay content of the upper 20 inches of the Bt horizon ranges from 18 to 35 percent. Reaction is strongly acid or very strongly acid. The Bt horizon is strong brown, reddish yellow, brownish yellow, or yellowish brown and has mottles of red, yellow, brown, and gray. There are gray colors in the lower part of the horizon because of shale fragments. In most pedons, the Bt horizon has 1 to 15 percent by volume pebbles and flattened fragments of ironstone.

The B3 horizon is mottled in shades of yellow, red, and gray. It commonly contains fragments of shale and sandstone. Reaction ranges from strongly acid to extremely acid.

The Cr horizon is stratified sandy clay loam, shale, and sandstone in colors of gray, red, and brown. The strata of sandstone can be cut by a spade. Reaction ranges from strongly acid to extremely acid.

Tahoula series

The Tahoula series consists of deep, gently sloping to moderately steep, somewhat poorly drained, very slowly permeable soils on uplands. These soils formed in calcareous, tuffaceous clayey sediment of the coastal plain (fig. 20). Slope ranges from 1 to 15 percent.

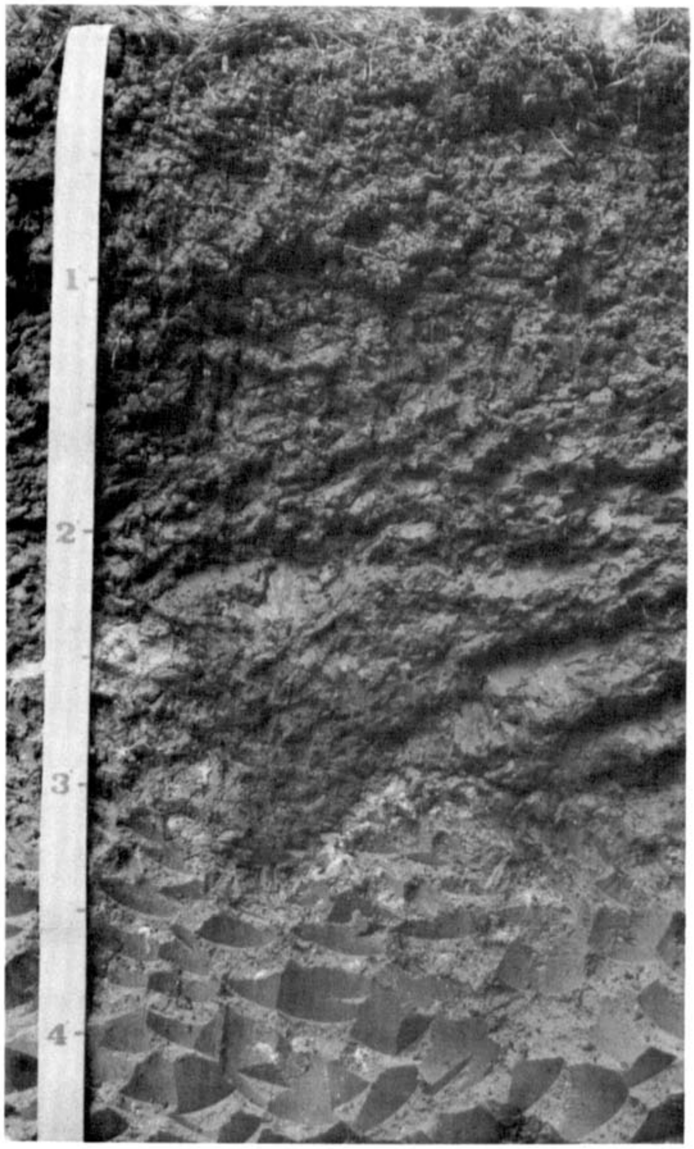


Figure 20.—A profile of Tahoula clay showing slickensides below a depth of 13 inches. Below a depth of 42 inches is massive clay that has a few concretions of calcium carbonate.

A typical pedon of Tahoula clay, 1 to 5 percent slopes, in Jasper County; from the intersection of U.S. Highway 96 and Farm Road 1007 at Browndell, 2.2 miles east on Farm Road 1007 to a fork in the road, 1.5 miles southeast, and 300 feet east of the road, in forest:

A11—0 to 5 inches; black (N 2/0) clay; moderate medium blocky structure; extremely hard, very firm, very sticky and very plastic; few fine roots and common medium and coarse roots; moderately alkaline; clear wavy boundary.

A12—5 to 13 inches; dark grayish brown (2.5YR 4/2) clay; strong medium blocky structure; extremely hard, very firm, very sticky and very plastic; common medium and coarse roots; moderately alkaline; gradual wavy boundary.

AC1—13 to 31 inches; olive gray (5Y 4/2) clay; common fine distinct olive (5Y 4/3) mottles; strong medium blocky structure; extremely hard, very firm, sticky and very plastic; few medium and coarse roots; few slickensides; few wedge-shaped peds that have axes tilted about 20 degrees from the horizontal; few pitted concretions of calcium carbonate; calcareous; moderately alkaline; gradual irregular boundary.

AC2—31 to 42 inches; olive (5Y 5/3) clay; moderate medium blocky structure; extremely hard, very firm, sticky and very plastic; few fine and medium roots; many intersecting slickensides; many distinct wedge-shaped peds that have their long axes tilted about 20 to 45 degrees from the horizontal; common soft masses and common pitted concretions of calcium carbonate; calcareous; moderately alkaline; diffuse irregular boundary.

C—42 to 65 inches; olive (5Y 5/3) clay; massive; extremely hard, very firm, very sticky and very plastic; few small slickensides; few soft masses and few pitted concretions of calcium carbonate; calcareous; moderately alkaline.

Undisturbed areas have a gilgai microrelief. It is 3 to 10 feet between the center of a microknoll and the center of a microdepression. The highs are 2 to 10 inches above the lows. Depth to intersecting slickensides ranges from 13 to 20 inches. Slickensides range from 1 to 3 feet across. The solum ranges from 40 to 60 inches in thickness. The boundary between the AC and C horizons is irregular and has length cycles ranging from 3 to 8 feet. The control section averages 60 to 80 percent clay.

The A11 horizon is black, very dark brown, very dark gray, very dark grayish brown, dark gray, or dark grayish brown. About 70 percent of the pedon has a value of 3.5 or more within a depth of 12 inches. Reaction ranges from very strongly acid to moderately alkaline. The moderately alkaline reaction is limited to the center of the microknolls.

The A12 horizon, if present, has colors similar to those of the A11 horizon but also ranges to grayish brown. Reaction is very strongly acid to moderately alkaline.

The AC horizon is light brownish gray, grayish brown, dark grayish brown, olive gray, or olive. Mottles in shades of brown and gray range from none to common. Few or common, soft masses and pitted concretions of calcium carbonate also are in most pedons. Reaction ranges from medium acid to moderately alkaline.

The C horizon is brown, gray, or olive and has few to common mottles in shades of brown, yellow, and olive. Few soft masses and pitted concretions of calcium carbonate are present. Masses of gypsum crystals range from none to few. Reaction ranges from medium acid to moderately alkaline. The C horizon commonly contains less calcium carbonate as depth increases.

Tehran series

The Tehran series consists of deep, undulating to hilly, somewhat excessively drained soils on uplands. Permeability is moderately rapid. These soils formed in thick loamy and sandy sediment of the coastal plain. Slope ranges from 1 to 20 percent.

A typical pedon of Tehran loamy sand, in an area of Tehran-Letney association, hilly, in Newton County; from the intersection of Farm Road 692 and Texas Highway 63 at Burkeville, 10.2 miles north along Farm Road 692, 1.8 miles northwest on a forest road, 0.7 mile northeast on a forest trail, and 100 feet south, in forest:

A11—0 to 5 inches; dark grayish brown (10YR 4/2) loamy sand; weak fine granular structure; loose, nonsticky and nonplastic; many fine roots and common medium and coarse roots; strongly acid; clear smooth boundary.

A12—5 to 13 inches; brown (10YR 5/3) loamy sand; few dark grayish brown (10YR 4/2) stains; single grained; loose, nonsticky and nonplastic; few medium and coarse roots; strongly acid; clear smooth boundary.

A21—13 to 36 inches; light yellowish brown (10YR 6/4) loamy sand; single grained; loose, nonsticky and nonplastic; few coarse roots; strongly acid; diffuse smooth boundary.

A22—36 to 51 inches; light yellowish brown (10YR 6/4) loamy sand; many fine faint light brown (7.5YR 6/4) mottles; single grained; loose, nonsticky and nonplastic; 8 percent siliceous gravel; very strongly acid; clear smooth boundary.

B21t—51 to 62 inches; reddish yellow (7.5YR 6/6) sandy clay loam; common coarse distinct brownish yellow (10YR 6/6) and few medium faint strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; thin patchy clay films on faces of peds; 8 percent siliceous gravel; very strongly acid; diffuse smooth boundary.

B22t—62 to 75 inches; mottled strong brown (7.5YR 5/6), red (2.5YR 5/8), yellowish red (5YR 5/6), and light gray (10YR 7/2) sandy clay loam; weak medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; thin patchy clay films on faces of peds; very strongly acid.

The solum is more than 80 inches thick. Reaction ranges from very strongly acid to medium acid throughout the profile. Clay content in the upper 20 inches of the argillic horizon ranges from 18 to 32 percent. Base saturation at a depth of 72 inches ranges from 15 to 30 percent. Ten to 25 percent of the sand fraction is coarse sand or very coarse sand.

The A horizon is a loamy sand or sand 40 to 72 inches thick. The A1 horizon is dark grayish brown, grayish brown, brown, yellowish brown, or dark yellowish brown. The A2 horizon is brown, yellowish brown, pale brown, light yellowish brown, very pale brown, or brownish yellow. Mottles are in shades of yellow and brown. Some pedons contain 5 to 10 percent siliceous gravel.

The Bt horizon is reddish yellow, strong brown, or brownish yellow and has mottles in shades of yellow, red, and brown. Mottles with chroma of 2 or less are 60 inches below the surface. The B2t horizon commonly is sandy clay loam but ranges to sandy loam in some pedons. Siliceous gravel in the Bt horizon ranges from 0 to 10 percent. Plinthite content ranges from 0 to 5 percent.

Urbo series

The Urbo series consists of deep, nearly level, clayey, somewhat poorly drained soils on bottom lands. Permeability is very slow. These soils formed in recent clayey alluvium. These soils are flooded about once in two years. Slope is 0 to 3 percent.

A typical pedon of Urbo clay, in an area of Urbo and Mantachie soils, frequently flooded, in Newton County; from the intersection of U.S. Highway 190 and Farm Road 2626 1 mile northwest of Bon Wier, 4.6 miles northeast along Farm Road 2626, 1.1 miles east along a county road, 3.4 miles east along a forest road, 0.2 mile south on a forest trail, and 100 feet west, in forest:

A1—0 to 4 inches; very dark grayish brown (10YR 3/2) clay; many medium faint dark grayish brown (10YR 4/2) mottles; moderate fine and medium granular structure; hard, firm, plastic; common fine, medium, and coarse tree roots; slightly acid; clear smooth boundary.

B21g—4 to 20 inches; grayish brown (10YR 5/2) clay; common medium distinct strong brown (7.5YR 5/6) and yellowish brown (10YR 5/6) mottles; moderate fine angular and subangular blocky structure; hard, very firm, very plastic; common fine, medium, and coarse tree roots; very strongly acid; gradual smooth boundary.

B22g—20 to 52 inches; grayish brown (2.5YR 5/2) clay; few yellowish brown (10YR 5/6) stains; strong fine angular blocky structure; very firm, very plastic; few fine and medium tree roots; very strongly acid; gradual smooth boundary.

B23g—52 to 65 inches; light brownish gray (2.5YR 6/2) clay; few fine prominent red (2.5YR 4/6) and yellowish red (5YR 5/6) mottles; moderate fine subangular blocky structure; very firm, very plastic; very strongly acid.

The solum is more than 60 inches thick. Reaction is strongly acid or very strongly acid throughout the control section.

The A horizon is dark grayish brown, grayish brown, dark brown, or very dark grayish brown clay, silty clay, silty clay loam, or clay loam.

The B21g horizon is grayish brown or brown. Most pedons have few to many mottles in shades of gray, brown, or yellow. The B22g to B23g horizons are grayish brown, gray, light brownish gray, or light gray. They are clay or silty clay. Clay content of the 10- to 40-inch control section is between 35 and 55 percent.

Urland series

The Urland series consists of deep, gently undulating to hilly, well drained soils on uplands. Permeability is moderately slow. The soils formed in stratified sandstone and clayey coastal plain sediment. Slope ranges from 1 to 20 percent.

A typical pedon or Urland fine sandy loam, in an area of Urland-Pinetucky association, undulating, in Newton County; from the intersection of U.S. Highway 190 and Farm Road 2626 1 mile northwest of Bon Wier, 4.6 miles northeast along Farm Road 2626, 1.1 miles east along a county road, 4.5 miles north and northeast on a forest road to an intersection, 1.0 mile southeast along a forest road, and 75 feet north, in forest:

A1—0 to 3 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine and medium granular structure; soft, very friable, nonsticky and nonplastic; many fine and medium roots; few coarse roots; few ironstone pebbles up to 2 centimeters across; medium acid; clear wavy boundary.

A2—3 to 10 inches; yellowish brown (10YR 5/4) fine sandy loam; weak medium granular structure; soft, very friable, nonsticky and nonplastic; many fine and medium roots; few coarse roots; few ironstone pebbles up to 2 centimeters across; medium acid; clear wavy boundary.

B21t—10 to 24 inches; red (2.5YR 4/6) clay; common medium distinct yellowish red (5YR 5/6) mottles; moderate fine blocky structure; very hard, very firm, very sticky and very plastic; few fine, medium, and coarse roots; continuous clay films on faces of peds; strongly acid; gradual wavy boundary.

B22t—24 to 48 inches; yellowish red (5YR 5/6) clay loam; common medium faint yellowish red (5YR 4/6) and few fine distinct red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; very hard, firm, very sticky and very plastic; few medium and coarse roots; continuous clay films on faces of peds; very strongly acid; gradual wavy boundary.

C—48 to 65 inches; stratified brownish yellow (10YR 6/8) clay loam, white (10YR 8/1) clay, and pink (5YR 7/4) soft sandstone, which are in layers less than 1 inch thick; very strongly acid.

The solum ranges from 40 to 60 inches in thickness. Base saturation ranges from 15 to 35 percent at a depth of 50 inches below the top of the argillic horizon.

Ironstone pebbles and fragments in the A horizon range from 0 to 15 percent by volume. Reaction ranges from strongly acid to slightly acid. The A1 horizon is very dark grayish brown, dark grayish brown, or dark brown. The A2 horizon is brown, light brownish gray, light yellowish brown, or yellowish brown.

The B21t horizon is red or yellowish red. Mottles range from none to common in shades of brown and red. The B21t horizon contains from 0 to about 10 percent by volume ironstone pebbles. It is clay, clay loam, or sandy clay. Clay content is 35 to 55 percent. Reaction is very strongly acid or strongly acid. The B22t horizon is red, yellowish red, or strong brown. Mottles are common or many in shades of gray, red, yellow, and brown. The B22t horizon is clay, clay loam, sandy clay loam, or sandy loam. Reaction is very strongly acid or strongly acid.

The C horizon is red, brown, yellow, gray, white, and pink. It is stratified or interbedded. The C horizon ranges from clay loam to sandy loam. In some pedons it is weakly cemented but can be cut with a spade. Reaction is extremely acid to strongly acid.

Vidrine series

The Vidrine series consists of deep, nearly level, loamy, somewhat poorly drained, slowly permeable soils on uplands. These soils formed in clayey alluvium. They are on low mounds, mostly 5 to 20 inches high and 50 to 200 feet across. Slope is less than 1 percent.

The Vidrine soils in Jasper and Newton Counties are more acid in the lower part of the B horizon than is typical for the Vidrine series. Because of this, they are considered a taxadjunct. This difference does not significantly affect use and behavior.

A typical pedon of Vidrine very fine sandy loam, in an area of Evadale-Vidrine complex, nearly level, in Newton County; from the intersection of Texas Highway 12 and Texas Highway 87 southwest of Deweyville, 1.7 miles north on Texas Highway 87, 500 feet west on a county road, and 120 feet north, in forest:

A1—0 to 3 inches; dark grayish brown (10YR 4/2) very fine sandy loam; weak fine granular structure; very friable, slightly sticky and slightly plastic; many fine roots; medium acid; clear wavy boundary.

A2—3 to 6 inches; light brownish gray (10YR 6/2) very fine sandy loam; weak fine granular structure; very friable, slightly sticky and nonplastic; many fine roots; medium acid; clear wavy boundary.

B1—6 to 18 inches; pale brown (10YR 6/3) very fine sandy loam; few fine distinct strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; common fine roots; common fine pores; strongly acid; gradual irregular boundary.

B21t&A2—18 to 21 inches; mottled yellowish brown (10YR 5/6), red (2.5YR 4/6), and gray (N 6/0) silty clay loam; about 15 percent by volume A2 material that is light gray (10YR 7/2) very fine sandy loam; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; common medium pores; strongly acid; clear wavy boundary.

B22tg—21 to 44 inches; gray (10YR 6/1) silty clay; few medium distinct strong brown (7.5YR 5/6) mottles and common medium prominent red (2.5YR 4/6) mottles; moderate fine subangular blocky structure; firm, sticky and plastic; few fine roots; few fine pores; strongly acid; gradual wavy boundary.

B23tg—44 to 60 inches; gray (10YR 6/1) silty clay loam; common medium distinct strong brown (7.5YR 5/6) mottles and few fine prominent red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; firm; strongly acid.

The solum ranges from 60 to 80 inches in thickness. Combined thickness of the A and B1 horizons is 18 to 30 inches. Because of wetness, grayish colors are within the upper 10 inches of the Btg horizons.

The A1 horizon is grayish brown, dark grayish brown, or brown. The A2 horizon is light brownish gray, pale brown, or brown. Reaction is medium acid or strongly acid.

The B1 horizon is pale brown, light yellowish brown, or yellowish brown. It is very fine sandy loam or silt loam. Discontinuous A horizons of light gray silt loam or very fine sandy loam occur as interfingering around peds of the Bt horizon. The B2tg horizon is gray, light gray, light brownish gray, or grayish brown. Mottles are common or many in shades of red, yellow, and brown. The Bt horizon is silty clay loam or silty clay. Some pedons have lower Bt horizons or B3 horizons that range from silt loam to clay, and some are stratified with these textures. Reaction of the Bt horizon is medium acid through very strongly acid, but it is neutral to moderately alkaline below a depth of 60 inches in some pedons.

Waller series

The Waller series consists of deep, nearly level, loamy, poorly drained, moderately permeable soils. These soils are on plane to depressional areas of uplands and terraces. They formed in thick beds of unconsolidated, loamy sediment. Slope is 0 to 1 percent.

A typical pedon of Waller very fine sandy loam, in an area of Waller-Evadale association, nearly level, in Jasper County; from the intersection of U.S. Highway 96 and Farm Road 2246 in Evadale, 0.8 mile east on Farm Road 2246 to the intersection with a county road, north and east 1.3 miles along the county road, and 100 feet south, in forest:

A11—0 to 2 inches; dark grayish brown (10YR 4/2) very fine sandy loam; weak fine subangular blocky structure; slightly hard, friable; strongly acid; clear smooth boundary.

A12—2 to 6 inches; grayish brown (10YR 5/2) very fine sandy loam; common medium distinct strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; slightly hard, friable; strongly acid; clear smooth boundary.

A2g—6 to 16 inches; light brownish gray (10YR 6/2) very fine sandy loam; common medium distinct strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; slightly hard, friable; strongly acid; gradual irregular boundary.

B21tg&A2—16 to 31 inches; light brownish gray (10YR 6/2) sandy clay loam; common medium distinct strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; hard, firm, sticky and slightly plastic; common tongues of light gray (10YR 7/2) very fine sandy loam; very strongly acid; gradual irregular boundary.

B22tg&A2—31 to 36 inches; light brownish gray (10YR 6/2) clay loam; common medium distinct strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; hard, firm, sticky and slightly plastic; common tongues, 1/2-inch to 2-inches wide, of light gray (10YR 7/2) silt loam and very fine sand; few thin discontinuous clay films; very strongly acid; gradual irregular boundary.

B23tg&A2—36 to 55 inches; gray (10YR 5/1) clay loam; common medium distinct strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; very hard, firm, very sticky and plastic; common tongues of dark grayish brown (10YR 4/2) loam; few thin discontinuous clay films; very strongly acid; gradual irregular boundary.

B24tg&A2—55 to 64; gray (10YR 5/1) clay loam; many medium distinct mottles of reddish yellow (7.5YR 6/6); weak fine subangular blocky structure; very hard, firm, very sticky and plastic; common tongues of dark grayish brown (10YR 4/2); very strongly acid.

The solum ranges from 60 to more than 80 inches in thickness. Reaction is generally medium acid to very strongly acid throughout, but it is slightly acid or neutral below a depth of 60 inches in some pedons.

The A1 horizon is dark gray, dark grayish brown, gray, or grayish brown. The A2g horizon is gray, light brownish gray, or light gray and has brown and yellow mottles. The lower part of the A2g horizon has vertical streaks of clean sand and silt that extend as tongues into the Btg horizon.

The B2tg&A2 horizon is gray, light gray, or light brownish gray and has mottles in shades of brown, yellow, and red. It is loam, clay loam, and sandy clay loam.

Wiergate series

The Wiergate series consists of deep, gently sloping and sloping, clayey, somewhat poorly drained soils on uplands. Permeability is very slow. These soils formed in weakly consolidated, calcareous clays and marls of the coastal plains (fig. 21). Slope ranges from 1 to 8 percent.

A typical pedon of Wiergate clay, 1 to 8 percent slopes, in Jasper County; from the intersection of U.S. Highways 190 and 96 in Jasper, 1.6 miles south on U.S. Highway 96, 0.4 mile east along a private road, 900 feet southwest along a forest trail, and 50 feet south, in forest:

A1—0 to 21 inches; black (10YR 2/1) clay; strong medium angular and subangular blocky structure; extremely hard, very firm, very sticky and very plastic; common fine and medium roots; few coarse roots; few fine pores; slightly acid; clear wavy boundary.

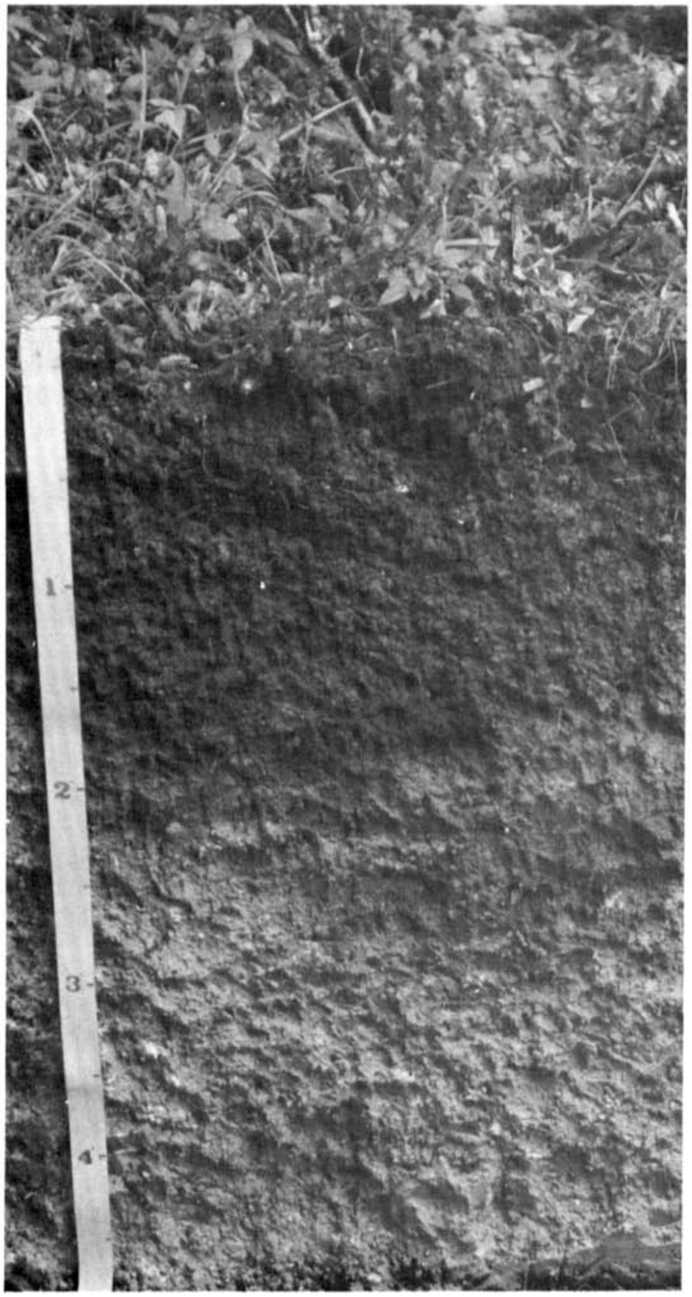


Figure 21.—A profile of Wiergate clay. Note the wavy boundary at a depth of about 21 inches. Below this depth the soil contains small concretions of calcium carbonate.

AC1—21 to 27 inches; pale olive (5Y 6/3) clay; many fine faint gray (5Y 6/1) mottles; strong medium angular blocky structure; extremely hard, very firm, very sticky and very plastic; few medium and coarse roots; few slickensides; about 4 percent by volume pitted concretions of calcium carbonate; calcareous; moderately alkaline; clear wavy boundary.

AC2—27 to 50 inches; gray (5Y 6/1) clay; many fine and few medium distinct olive yellow (5Y 6/6) mottles and few medium prominent greenish gray (5G 6/1) mottles; moderate medium angular blocky structure; extremely hard, very firm, very sticky and very plastic; many large intersecting slickensides forming wedge-shaped peds that have their long axes tilted about 45 degrees from the horizontal; about 4 percent by volume pitted concretions of calcium carbonate; calcareous; moderately alkaline; diffuse wavy boundary.

AC3—50 to 75 inches; mottled gray (5Y 6/1), light yellowish brown (2.5Y 6/4), and brownish yellow (10YR 6/6) clay; moderate medium angular blocky structure; extremely hard, very firm, very sticky and very plastic; many large intersecting slickensides forming wedge-shaped peds that have their long axes tilted about 45 degrees from the horizontal; about 4 percent by volume pitted concretions of calcium carbonate, few soft masses of calcium carbonate; calcareous; moderately alkaline.

Undisturbed areas have a gilgai microrelief. The distance from the center of a microknoll to the center of a microdepression is 4 to 15 feet. The difference between the high and low points is 2 to 12 inches. The depth to intersecting slickensides ranges from 15 to 36 inches. The solum ranges from 60 to more than 80 inches in thickness. The control section averages 60 to 80 percent clay.

The A horizon ranges from 2 inches thick on the microknolls to 36 inches thick in the microdepressions. Thickness of the A horizon averages about 20 inches in most of the pedon. The A horizon is black or very dark gray. Reaction ranges from slightly acid to mildly alkaline. Pitted calcium carbonate concretions are none or few.

The AC horizon is light brownish gray, dark grayish brown, light gray, grayish brown, very dark grayish brown, pale yellow, light yellowish brown, light olive brown, pale olive, dark olive gray, or gray. Concretions of calcium carbonate are few or common. Most are pitted in the upper part of the AC horizon. Soft masses of calcium carbonate are none or few in the lower part of the AC horizon. Mottles in shades of yellow, brown, gray, and olive range from few to many. Intersecting slickensides are common or many and are a few inches to a few feet across.

Woodville series

The Woodville series consists of deep, gently undulating, loamy, somewhat poorly drained soils on uplands. Permeability is very slow. These soils formed in thick beds of unconsolidated, clayey coastal plain sediment (fig. 22). Slope ranges from 0 to 5 percent.

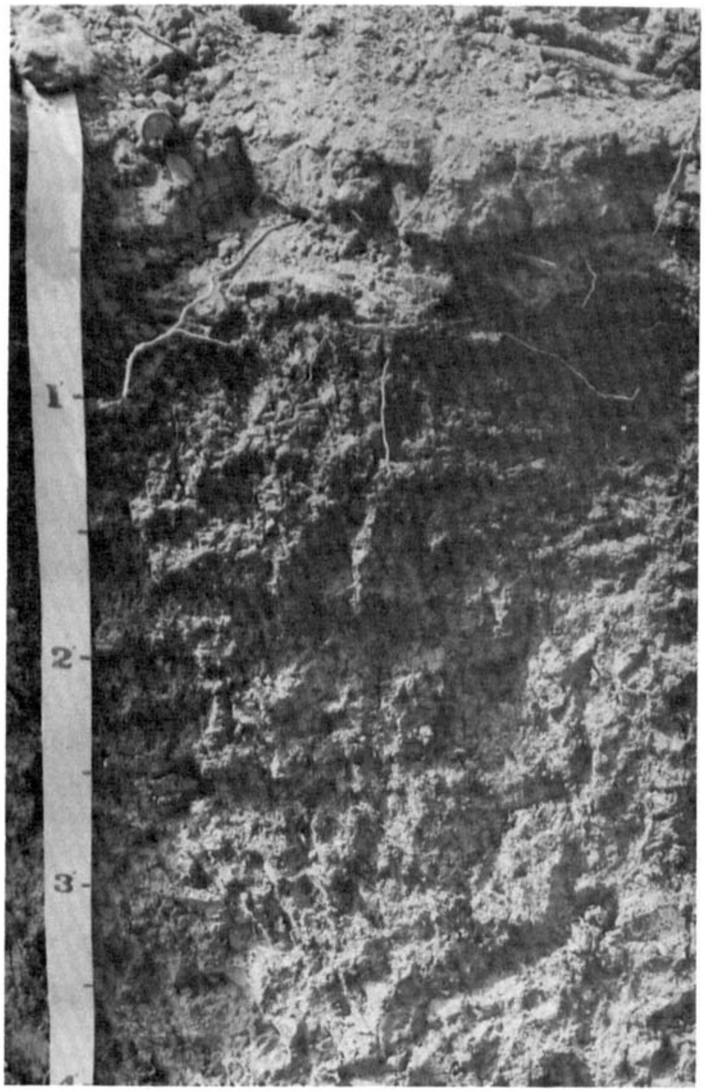


Figure 22.—A profile of Woodville fine sandy loam. The subsoil, which begins at a depth of about 9 inches, is blocky clay.

A typical pedon of Woodville fine sandy loam, in an area of Woodville-Redco association, gently undulating, in Jasper County; from the intersection of U.S. Highways 96 and 190 in Jasper, 3.2 miles south on U.S. Highway 96, 0.95 mile east along a forest road, and 60 feet south, in forest:

A1—0 to 5 inches; dark grayish brown (10YR 4/2) fine sandy loam; common fine and medium faint grayish brown (10YR 5/2) mottles; weak fine granular structure; soft, friable, slightly sticky and nonplastic; many fine, medium, and coarse roots; strongly acid; clear smooth boundary.

A2—5 to 9 inches; pale brown (10YR 6/3) fine sandy loam; many coarse faint brown (10YR 5/3) mottles; weak fine granular structure; soft, friable, slightly sticky and nonplastic; many fine, medium, and coarse roots; strongly acid; clear wavy boundary.

B21t—9 to 20 inches; dark red (2.5YR 3/6) and red (2.5YR 4/6) clay; common medium prominent pinkish gray (7.5YR 6/2) and light brownish gray (10YR 6/2) mottles; strong fine and medium angular blocky structure; very hard, very firm, very sticky and very plastic; common fine, medium, and coarse roots; few small intersecting slickensides; many pressure faces; very strongly acid; diffuse irregular boundary.

B22t—20 to 45 inches; mottled red (2.5YR 4/6) and light gray (10YR 7/1, 7/2) clay; common medium prominent reddish yellow (7.5YR 6/6) mottles; strong fine and medium angular blocky structure; very hard, very firm, very sticky and very plastic; few medium and coarse roots; few medium intersecting slickensides; many pressure faces; very strongly acid; diffuse irregular boundary.

B23t—45 to 65 inches; light gray (10YR 7/1) clay; common medium prominent dark red (10YR 3/6) and brownish yellow (10YR 6/8) mottles; strong fine angular blocky structure; very hard, very firm, very sticky and very plastic; few slickensides that do not intersect; very strongly acid.

B3g—65 to 80 inches; light gray (10YR 7/1) clay; few medium prominent dark red (10R 3/6) and common brownish yellow (10YR 6/8) mottles; moderate coarse blocky structure; very hard, very firm, very sticky and very plastic; medium acid.

The solum ranges from 60 to about 80 inches in thickness. Base saturation ranges from 35 to 60 percent at a depth of 50 inches below the top of the argillic horizon. Clay content ranges from 40 to 60 percent in the upper 20 inches of the argillic horizon and has a COLE of 0.09 or more. The potential linear extensibility is more than 6 centimeters.

The A horizon is 6 to 15 inches thick. Reaction ranges from very strongly acid to slightly acid. The A1 horizon is grayish brown or dark grayish brown. The A2 horizon is grayish brown, brown, or pale brown. The boundary between the A horizon and Bt horizon is smooth or wavy, and there is an abrupt change in texture.

The B21t horizon is red, dark red, reddish brown, reddish yellow, yellowish red, brown, or strong brown. Mottles are few or common in shades of gray, brown, and red; the amount of gray increases with depth. Reaction ranges from very strongly acid to strongly acid. The B22t horizon is gray, light brownish gray, or light gray. Mottles are common or many in shades of red, yellow, and brown. Reaction is very strongly acid or strongly acid. The B3g horizon is mostly in shades of gray mottled with red, yellow, brown, and olive. It is extremely acid to strongly acid clay or shaly clay.

formation of the soils

This section discusses the factors of soil formation and relates them to the formation of the soils in Jasper and Newton Counties. It also discusses the surface geology of the survey area.

factors of soil formation

The characteristics of a soil at any given point are determined by the physical and mineral composition of the parent material; the climate under which the parent material accumulated and has existed since accumulation; the plant and animal life on and in the soil; the relief, or lay of the land; and the length of time the forces of soil formation have acted on the soil material. All five of these factors have influenced the present characteristics of every soil, but the significance of each factor varies from one place to another. In one area one factor may dominate the formation of a soil, and in another area a different factor may be more important.

The interrelationship among these five factors is complex, and the effects of any one factor cannot be isolated and completely evaluated. It is convenient to discuss each factor separately, however, and to indicate the probable effects of each.

parent material

Parent material is the unconsolidated mass from which a soil forms. It determines the chemical and mineral composition of the soil. In Jasper and Newton Counties, the parent material consists of unconsolidated sediment of the Miocene, Pleistocene, and Holocene Epochs (*11*).

Deposits of the Miocene Epoch are the Catahoula Formation and the Fleming Formation. Deposits of the Pleistocene Epoch are the Willis, Bentley, Montgomery, and Beaumont Formations and the fluviatile terraces of the Neches, Angelina, and Sabine Rivers. The Holocene (Recent) Epoch includes alluvial deposits of the Angelina, Neches, and Sabine Rivers and the many smaller streams in the two counties.

Soils of the Catahoula Formation include Corrigan, Rayburn, Kisatchie, Tahoula, Browndell, and Nikful soils. Soils formed in this formation have a clayey subsoil. Soils of the Fleming Formation are Woodville, Redco, Wiergate, and Burkeville soils. Most of these soils also have a clayey subsoil.

Soils of the Willis Formation include Letney, Tehran, Pinetucky, Doucette, Boykin, Shankler, Newco, Stringtown, Bonwier, Rogan, and Urland soils. These deposits are mainly layers of soft sandstone and shale. Soils in these areas vary greatly, but mainly they have a loamy and clayey subsoil.

Soils of the Bentley and Montgomery Formations include Malbis, Kirbyville, Jasco, and Niwana soils. These soils mainly have a loamy subsoil.

Soils of the Beaumont Formation include Evadale, Gist, Waller, and Vidrine soils. Most of these soils have a clayey subsoil.

Fluviatile terraces are along the large rivers and streams. These areas are old alluvial bottom lands that have been modified by wind. Soils in these areas are Bernaldo, Bienville, Alaga, Besner, Gallime, Mollville, and Spurger soils. These soils vary greatly, but most have a loamy and sandy subsoil.

The soils on alluvial areas, or bottom lands that flood, have little horizon development. These are Mantachie, Iuka, Bleakwood, and Urbo soils. They have a loamy and clayey subsoil.

climate

The climate of Jasper and Newton Counties is humid. Rainfall, evaporation, and temperature are the main climatic influences. The moderate to large amount of rainfall has promoted moderately rapid soil development throughout the survey area. Rainfall is uniform over the area, although its effect is modified locally by runoff caused by slope. Because of the uniformity in climate, the differences between soils are not attributed to climatic differences.

plant and animal life

Plants, insects, micro-organisms, crayfish, earthworms, and other living organisms have contributed to the development of the soils. Gains in organic matter and nitrogen content of the soil, gains or losses in plant nutrients, and changes in structure and porosity are caused by plant and animal life.

Vegetation, dominantly trees, has greatly affected soil formation in the two counties. Soils that formed under trees are generally low in organic matter content and light in color.

The soils of the Wiergate series are the only soils in the survey area that have been greatly affected by grasses. Wiergate soils are dark and are relatively high in organic matter content.

relief

Relief, or topography, influences soil development through its effect on drainage, runoff, and depth of penetration by soil moisture.

The topography of the survey area ranges from nearly level to hilly. The nearly level areas consist of bottom lands throughout both counties and terraces in the southern part of the survey area. The more sloping areas are mostly in the northern half of the survey area.

If other factors are equal, the degree of soil profile development depends on the amount of and depth of penetration by soil moisture. The more often a soil passes through a wetting and drying cycle, the greater and the more distinct is the soil development.

Soils on a nearly level landscape tend to have marked differences in soil development. Nearly level areas that are poorly drained and that remain saturated much of the time generally do not have pronounced soil horizonation. They will be degraded and generally are not developed below a depth of 60 inches. Nearly level soils that are well drained generally are distinctly developed to depths greater than 80 inches.

Most of the gently sloping and sloping soils are developed to depths greater than 60 inches. Generally, as the slope increases above 8 percent, there is a decrease in the depth of water penetration. Since much of the water is removed by runoff, the soils on the more sloping areas tend to be shallower. For example, the Bonwier soils are mostly sloping to hilly and are moderately deep to shale or sandstone. Most of the other soils in the survey area are deep.

time

A great length of time is required for the formation of soils with distinct horizons. The differences in the length of time that the parent material has been in place are commonly reflected in the degree of development of soil horizons. Young soils have very little horizon development, and old soils have well expressed horizons.

Mantachie and Iuka soils are young soils. They are forming on bottom lands that flood, and sediment is continuously being added. These soils have little soil horizon development.

The Attoyac and Bernaldo soils are of intermediate age. Since they are on fluviatile terraces that have not been deposited as long as most landforms of the area, the soils have not undergone maximum development. For instance, neither of these soils has been leached of bases as have many of the older soils on the uplands.

Advanced stages of development are evident in the Pinetucky and Doucette soils. These soils have distinct horizonation, have been leached of most bases, and have accumulations of iron enriched nodules (plinthite) in their lower parts.

surface geology

This section was prepared by Saul Aronow, Department of Geology, Lamar University.

Jasper and Newton Counties are in the West Gulf Coast subdivision of the Atlantic and Gulf Coastal Plains geomorphic unit (*10*). The surface rocks and sediments dip gently gulfward and range from Holocene (Recent) to Tertiary in age.

The survey area is V-shaped and lies between the Neches River on the west and the Sabine River on the east. The confluence of these rivers is a few miles south of the survey area. The eastern and western borders of the survey area are Holocene alluvial deposits on bottom lands. At higher elevations, above the flood plains, there are several levels of fluvial terraces that grade to the uplands in the interior. Narrow, Holocene alluvial deposits along the streams extend into the interior of the survey area.

Most of the drainage in the area is to the Sabine River. The divide between the drainage areas of the Sabine and Neches Rivers is mostly in Jasper County, although a small part of the divide in the extreme northern part of the area is in Newton County. On the general soil map, the Sabine drainage can be seen in the many long fingers of the Iuka-Mantachie general soil map unit extending northwestward from the Sabine River.

Several regional geologic features are in the area. One of these is the Hockley Scarp, which occurs as an abrupt break in slope between the Willis Formation and younger, gulfward formations (*3*). Locally, the scarp generally coincides with the boundary between the Pinetucky-Shankler-Doucette and the Malbis general soil map units.

The east-west trending low area occupied by the Woodville-Redco general soil map unit is called the Burkeville Lowland (*3*). This lowland separates the northern (Mayflower Upland) and southern (Zion Upland) parts of the Willis Formation (approximately the Tehran-Letney and the Pinetucky-Shankler-Doucette general soil map units, respectively). The Burkeville Lowland divides much of the Willis outcrop area throughout the Texas Gulf Coast. The Kisatchie Wold, a regionally extensive cuesta held up by the gulfward-dipping Catahoula Formation, traverses the northern border of the area (approximately the Rayburn-Tehran-Kisatchie general soil map unit). The cuesta causes the eastward deflection of the Neches River in the extreme northwestern part of the area and the northward flow of drainage in the northern part of the area west of the Sam Rayburn Reservoir.

The geologic units in the survey area are divided into four categories, based on age and geomorphic expression—

- a Tertiary sequence—includes the Whitsett, Catahoula, and Fleming Formations.
- a Plio-Pleistocene formation— the Willis Formation.
- a Pleistocene sequence—the Bentley, Montgomery, and Beaumont Formations.
- a late Pleistocene to Holocene sequence—the Deweyville Formation or terraces and Holocene alluvium.

The relationship between the geologic formations and the general soil map units is summarized in table 20.

the Tertiary sequence

The oldest rocks in the survey area are Tertiary in age, ranging from Eocene to Miocene. The Whitsett and Nash Creek Formations and the uppermost parts of the Jackson Group of upper Eocene age crop out and straddle the northern county lines. These formations orginated in deltaic to shallow-water marine (shelf) areas. They contain bentonitic clays (weathered and probably stream-reworked volcanic ash), tuffaceous sands and clays, and some thin lignite beds (*7, 15*). They fall within parts of the Tehran-Letney and Rayburn-Tehran-Kisatchie general soil map units. Because of the thin, spotty, reddish residuum of the Willis Formation and the bentonitic-tuffaceous character of the parent material in the area, no unique soils have formed.

The Catahoula Formation of Oligocene and early Miocene age overlies the Jackson Group and crops out as a band 2 to 5 miles wide along the northern edge of the counties. It is the most extensive Tertiary formation with bentonitic and tuffaceous material in East Texas. The Catahoula Formation is largely fluviatile in origin (*8*). It consists of channel and point-bar sandstones; levee and crevasse-splay sandstones, siltstones, and mudstones; and flood plain and interchannel siltstones, mudstones, and claystones. These materials contain volcanic ash. Some have weathered to bentonitic clays and are in place or reworked. Others contain reworked volcanic ash. The in-place materials are mainly lacustrine deposits.

An unusual lithology in the Catahoula Formation is the calcareous parent material of the Tahoula series, a calcareous Vertisol. The parent material of the Tahoula soils is probably one or both of the fluvial facies that contain calcium carbonate modules—crevasse splay and the well drained flood plain (*8*).

The rain of volcanic ash that began in late Eocene time and continued through the Oligocene and part of the Miocene time was blown in from Mexico, New Mexico, and the Trans-Pecos area of Texas.

The Rayburn-Tehran-Kisatchie general soil map unit east and west of the Sam Rayburn Reservior, and the Tehran-Letney map unit west of the reservoir characterize the Catahoula Formation. Within these map units, the Kisatchie and Rayburn soils formed in the Cathoula Formation. Also in this formation are Browndell, Nikful, and Tahoula soils. The Tehran and Letney soils in this area formed in a thin (probably less than 15 feet thick in most places), discontinuous cover of the stratigraphically overlying Willis Formation. Only part of this patchy Willis distribution is shown on the latest geologic map (*15*).

Overlying the Catahoula Formation is the Fleming Formation of Miocene age, the last of the definitely Tertiary units. Where exposed, the Fleming Formation is generally dark gray, calcareous clay. The principal area of exposure of the Fleming clay is in the Burkeville Lowland, where the Willis Formation has been removed by erosion. This area roughly corresponds to the Woodville-Redco general soil map unit. The Fleming clay has many calcareous concretions throughout, but these concretions are not the result of surface weathering (*12*) as they are in younger sediment and soils. Locally, the Fleming Formation contains cross-bedded, calcite-cemented sandstones and calcareous siltstones. The Fleming Formation is deltaic to nearshore shallow water marine in origin (*12*).

While geologic maps (*3, 16*) show large areas of Fleming outcrop, few soils that formed in Fleming lithologies can be found. Some of these are Burkeville, Wiergate, Redco, and Woodville soils. The Burkeville and Wiergate soils (about 18,000 acres) are calcareous Vertisols. They are less extensive than the reddish and brownish Redco and Woodville soils (about 45,000 acres). The Redco soils are Vertisols, and the Woodville soils are Alfisols that have a fine sandy loam A horizon and a clayey subsoil. If the Redco and Woodville soils formed in Fleming parent material, they have been extensively leached of calcareous components by soil solutions which may have passed through the now almost obscure Willis cover. The only traces are the reddish, brownish, and yellowish iron oxide pigments of the sola and the fine sandy loam A horizon of the Redco series. Further geologic study may show that some sandy and loamy soils thought to have Willis parent material, or to have formed through the thin Willis residua, are actually products of sandy and silty Fleming lithologies reacting to similar weathering conditions as the Willis.

The locally clayey lithology of the Fleming Formation may be the reason for the removal of the Willis Formation from the Burkeville Lowland, the major area of Fleming outcrop (*3*). Elsewhere, the Fleming Formation has a more permeable, sandy and silty lithology. Therefore, ground water percolation is faster, runoff is less, and excessive headward erosion and gullying is not promoted as in the areas of the clayey areas of Fleming Formation.

the Plio-Pleistocene formation

The Willis Formation is transitional in age from Pliocene to Pleistocene. Its age is uncertain, and it has been considered as Pliocene, Plio-Pleistocene, preglacial (pre-Nebraskan) Pleistocene, and glacial (Nebraskan) Pleistocene. It is most likely Plio-Pleistocene or preglacial Pleistocene.

Two broad bands of Willis outcrop cross the northern half of the survey area. The north part generally coincides with the Tehran-Letney and some of the Pinetucky-Shankler-Doucette general soil map units; the south part includes most of the Pinetucky-Shankler-Doucette map unit. The two bands are separated by areas of the Woodville-Redco general soil map unit.

The Willis Formation is probably fluviatile in origin. Several fluvial environments are represented, such as cross-bedded channel and point bar (coarser, gravelly sand deposits) and levee, crevasse splay, and flood basin (finer, less sandy and more silty and clayey deposits).

Gravel probably comprises less than 10 percent of the formation, and is mostly siliceous—cherts and "petrified" wood fragments. In many places where the bedding is preserved, the gravel and very coarse sand fraction is represented by rounded to chip-like clay fragments. Some rounded, cobble to boulder-size fragments (up to 15 inches in diameter) are present. They may have been derived from underlying Tertiary clays (*3*) or previously deposited, clayey Willis facies. Sand and gravel deposits with abundant clay clasts are locally called soapstone. Where these materials are weathered and mass wasted, the bedding may be obliterated and the clays composing the clasts dispersed. In many places, this produces geologically anomalous unbedded mixtures of gravel, sand, and clay in the soil sola.

The higher gravel content of the Tehran and Letney soils of the northern Mayflower Upland (as compared with soils of the southern Zion Upland) may reflect a downstream "fining" by the dropping and by-passing of coarser upstream materials. The greater abundance of plinthite and ironstone concretions in the Pinetucky-Shankler-Doucette soils of the southern Zion Upland may be the result of a difference in age, or it may have been caused by lithologic differences related to depositional facies.

Most of the Willis lithologies, as seen in road cuts and sand pits, are pigmented and cemented by reddish, brownish, or purplish ferric iron oxides to depths of more than 15 feet. Of the formations in the area, the Willis Formation displays the deepest surface weathering zones and the thickest soil sola, many to a depth of more than 80 inches. Some of the factors related to the depth of the Willis weathering probably include (1) the high initial permeability of the coarse parent materials, now somewhat reduced by iron-oxide cementation and clay formation; (2) the length of the drained soil column above the water table because of the dissection and high topographic position; and (3) the great age of the formation compared with the younger geologic units to the south and those in terrace and stream channel positions. Possibly the thick sola are inherited from times of higher rainfall and warmer climates—times of more intense weathering. Some of the C horizons identified in the Willis soils may be the B horizons of older soils.

The Willis Formation was once more extensive. It probably covered most of the surface of the survey area, north of which it disappears below younger formations. Many Willis outcrops can be identified in Sabine, San Augustine, and Angelina Counties to the north.

Remnants less than 2 feet thick to more than 6 feet thick of the Willis Formation mask the major parts of the outcrop areas of older formations. This has produced many discrepancies between the available small scale geologic maps (*3, 15, 16*) and the general soil map and detailed soil maps of this survey. Much of the masking, for example of the Fleming Formation on the slopes of stream valleys, was probably accomplished by mass wasting and erosion from topographically higher position during and following the incision of the stream valleys. Continued weathering and iron-oxide cementation either was resumed after or post-dated the downslope emplacement of the mass-wasted surface material. Though Bernard (*3*) assumed a fairly plane interface between the Willis Formation and the underlying formations, at least some of the displaced Willis material may have been originally deposited on a previously channeled surface. This seems likely in view of the apparent reversals of the original Willis depositional topography as indicated by the ridge crest and flat ridgetop positions of gravelly and coarse sandy channel and point bar deposits.

Some of the variations in soils developed on the Willis Formation probably involve differences between slope transported parent material versus *in situ* parent material, different ages for the stabilization and recementation of the parent material, and the depth of the local water table.

the Pleistocene sequence

The formations younger than and mostly gulfward of the Willis Formation largely have V-shaped outcrop areas, while the Willis extends indifferently east-west across the survey area. The wings of the V-pattern of the younger formations are essentially high level terraces paralleling the Sabine and Neches Rivers. Thus, they betray their origin as deposits of the Pleistocene ancestors of the modern streams. The Willis and the older Tertiary formations, products of even older ancestral streams, retain few if any geomorphic indicators of the original depositional landforms. Depositional systems for these must be reconstructed using surface and subsurface lithologic areal distribution patterns (*7,8*). Contrasts between the two outcrop patterns may be seen on the general soil map by comparing the east-west trending distribution of the Tehran-Letney map unit (Willis Formation) with the V-shaped distribution of the Evadale-Gist map unit (Beaumont Formation).

The Post-Willis geologic units, except for the Holocene alluvium, contain two kinds of microrelief features: (1)shallow, circular to elliptical, undrained depressions and (2) pimple mounds. These features influence the local distribution of soils and characterize some of the soil associations and series.

Shallow, undrained depressions are rare on the older, well dissected, Tertiary to Plio-Pleistocene terrains (the Pinetucky-Shankler-Doucette, Tehran-Letney, Rayburn-Tehran-Kistachie, and Woodville-Redco general soil map units). They are more abundant on the Pleistocene terrains (the Malbis, Kirbyville-Malbis, and Evadale-Gist general soil map units). On the surface of the Beaumont Formation (approximately the Evadale-Gist map unit), undrained and drained depressions range from fluviatile in origin to anomalous or undefined.

Some of the depressions, sometimes called flatwoods ponds, are intermittently ponded. Others are marshes. They are generally less than 1,000 feet in diameter and less than 5 feet deep. Many are on flat, upland remnants and may be inherited from segmented or detached sections of streams or oxbows, transitions to which can be seen on the Beaumont surface (Evadale-Gist general soil map unit). Other depressions occupy the slopes of broad drainageways and are unlikely to be relicts of an older depositional topography of fluvial origin. These, and the depressions on the flatter uplands, may have originated as shallow eolian blowouts under a more arid climate. Other possible explanations of their genesis include effects of subsurface solution of soluble materials and piping.

Pimple mounds are small, round to elliptical knolls 50 to 200 feet in diameter and generally less than 3 feet high. They are found on surfaces of the Pleistocene to late Pleistocene formations. Soils on mounds generally include Gist, Vidrine, Niwana, Besner, and Malbis soils. In most places, the texture of the surface layer of mounded soils does not contrast markedly with that of the major intermound soils. Where it does contrast, the mounds are coarser and include Niwana fine sandy loam and Gist very fine sandy loam instead of Evadale silt loam and Waller loam.

Mounds are generally on the flatter areas. They are absent from the erosionally dissected Willis and older formations. They are also absent from the very low gradient Holocene alluvial surfaces.

Similar mounds are found on Pleistocene surfaces from the western edge of the Mississippi River flood plain in Louisiana to south of Corpus Christi Bay in Texas. As in the Jasper-Newton County area, the mounds are mostly sandy or loamy. There are several theories of mound origin. They may have originated as residual patches left after sheetflood erosion or deflation of the surface by wind; accumulation of wind-transported sand, silt, or clay chips around clumps of vegetation; wind accumulations whose sites were started by, or later topographically enhanced by, erosional processes; or the "fluffing up" or lowering of the bulk densities of A and B horizon material by the burrowing activities of animals, with possible eolian increments. The idea of windborne increments to the mounds questions the strictly pedogenic origin of the upper horizons. Origins involving eolian processes presuppose an earlier grassland vegetation prior to present-day forest conditions. On the assumption that the Niwana and Malbis (Paleudults) and Besner (Paleudalfs) mounds are older than the Gist (Glossudalf) and Vidrine (Hapludalf) mounds, there probably have been at least two episodes of mound formation, unless the differences are related to drainage, topographic conditions, or mode of origin.

The deposition of the younger Pleistocene formations and the Holocene alluvium was controlled by changes in sea level caused by the several advances and retreats of continental glaciers. During the expansions of the continental glaciers, water was removed from the oceans and transferred to land areas as snow, causing the sea level to drop about 250 to 300 feet. At these times, streams draining into the oceans graded to a new sea level, lowered their valleys, and extended themselves across now-concealed continental shelves. Between the major glaciations, the sea level rose to levels similar to the present heights, previously enlarged valleys alluviated, and the lower reaches of the streams submerged.

During the cyclic changes in sea level, the whole Gulf coast tilted progressively seaward, a continuation of the general subsidence of the Gulf which started over 100 million years earlier. Preserved depositional surfaces of older formations have been subjected to successive tiltings and have progressively greater slopes than surfaces of younger formations.

The post-Willis formations are thought to be the products of the interglacial times of high sea level. The Willis Formation is considered by some investigators (*3,4*) to be the earliest of the sea level-controlled formations.

The criteria for differentiating the Pleistocene formations include litholgoic differences; regional slope of uneroded, preserved portions of the surfaces; scarps or sharp slope discontinuities bounding the units; and the presence or absence of such minor surface, or geomorphic, features as small undrained depressions.

The formations can be divided roughly into a coarse-grained "fluvial" facies, represented by river-paralleling terraces, and a finer-grained "deltaic" facies, occupying the central, interfluvial area between the major rivers (*3*). The surface of the two facies may be topographically continuous, or, if isolated, it may be correlated by slope and elevation extrapolations.

Two Pleistocene formations, the Bentley and the Montgomery, approximate the Kirbyville-Malbis and the Malbis general soil map units, respectively. The surface of these formations and the scarps bounding the outcrop areas of these formations are, in places, badly gullied and eroded. The Willis and Beaumont Formations can be fairly well delineated on a lithologic and geomorphic basis, but these two intermediate formations are poorly defined. Of the two, the Montgomery Formation is more extensive and more easily identified. An older geologic map (*5*) places these two formations in a Lissie Formation, a concept for the post-Willis, pre-Beaumont age formations preferred by some geologists because of the difficulty of separating these two units, or because they believe only one valid unit exits.

Some of the terraces of the Besner-Bernaldo general soil map unit have been correlated with the Bentley and Montgomery Formations and would constitute the fluvial facies of these formations. The age of the Besner-Bernaldo map unit is several hundred thousand (Bentley Formation) to several tens of thousands (Deweyville Formation) of years before the present. This range suggests that further work is needed on the terrace correlations.

The Beaumont Formation has both gulf-paralleling and terrace outcrop areas. It comprises all of the Evadale-Gist map unit and parts of the Kirbyville-Malbis map unit, especially the parts west of Big Cow Creek in Newton County and west and south of Buna in Jasper County. In both these parts there is a mixture and interfingering of characteristic Beaumont-age soils (for example, Waller and Evadale soils) and older plinthic Paleudults. In addition, some terraces correlated mainly by elevation with the main area of Beaumont Formation, in the southern part of the survey area fall within the Besner-Bernaldo general soil map unit, especially those just southeast, east, and northeast of the Steinhagen Lake reservoir.

The Beaumont Formation, like the other Pleistocene formations, is fluviatile to deltaic in origin. The Evadale-Gist general soil map unit would be the deltaic part. The Besner-Bernaldo general soil map unit would be the fluvial part. In a few places, relict depositional features are preserved in the form of discontinuous stream segments and anastomosing meander patterns. The most clearly discernable areas of these are south and southeast of Evadale in Jasper County where the lower channel remnants are occupied by the Waller-Evadale association and soils of the Evadale series. To the east, toward the Sabine River, the pattern becomes less distinct. In some places, the pattern is not augmented by soil differences but appears merely as meandering traces of shallow intermittent streams within the Evadale-Vidrine and Evadale-Gist complexes. Where the meander patterns are clearly seen, they are similar in size to those of the present day Neches and Sabine Rivers, the ancestors of which laid down the Beaumont Formation in this area.

the late Pleistocene to Holocene sequence

Most radiocarbon dates on the Beaumont Formation are older than 40,000 years. Possibly they fall within a high sea-level episode of the Wisconsin glaciation or in the major interglacial period between the Wisconsin and Illinoian glaciations, the Sangamon. Following the deposition of the Beaumont Formation, the sea level dropped and the local major streams widened and deepened their channels. The fluviatile portions of the Beaumont Formation acquired their raised or terrace positions. The subsequent Deweyville Formation (the Bienville-Alaga general soil map unit) and the Holocene alluvium (mostly the Urbo-Mantachie general soil map unit) are the backfillings of these deeper, glacially controlled channels. In some places the Deweyville Formation and Beaumont fluvial portions have similar elevations, and the Deweyville Formation is no more than a thin veneer over scoured Beaumont-age sediment. This probably explains some puzzling juxtapositions of terrace levels and soils within the Besner-Bernaldo general soil map unit.

The group of the geological units that includes the late Pleistocene Deweyville Formation and the Holocene alluvium differs from the previous units in that its surface expression is confined solely to north-south terraces and flood plains. There are no east-west upland outcrops.

The Deweyville Formation contains the uniformly coarsest deposits in the area. The Bienville-Alaga general soil map unit developed on the Deweyville Formation. Along the Sabine River these units generally coincide. Along the Neches River, the Deweyville Formation includes some low lying parts of the Besner-Bernaldo general soil map unit, especially in the region flanking the Steinhagen Lake Reservoir on the east, and, farther to the south, east and north of the areas of Bienville-Alaga general soil map unit.

The Deweyville Formation is named for Deweyville in southern Newton County, where the terrace surface of the formation occupies a position intermediate between the surfaces of the Beaumont upland and the Holocene alluvium. The Deweyville material is mainly sand with some gravel less than 3/4-inch in size. The surface is characterized by meander remnants or oxbows, channel segments, and undulating or corrugated point bar deposits. All of these display radii of curvature greater than those of the present-day Sabine and Neches Rivers.

Meander scars scallop the edge of uplands bounding both the Deweyville Formation and, where the Deweyville is concealed, the Holocene alluvium. Because the size of stream meanders is proportional to the discharge of a stream, it is known that both streams were considerably larger when the Deweyville Formation was laid down than they are at present. Probably the higher discharge was the result of greater precipitation during some phase of the continental glacier advance-and-retreat cycle. Downstream along the Sabine and Neches Rivers, Deweyville deposits descend below sea level, as they do along other Gulf Coast streams. This suggests that the higher discharges were, in part, synchronous with a stage in which the sea level was lower than at present. These are undoubtedly several different terrace levels included under the Deweyville Formation along the Gulf Coast, ranging in age from about 34,000 to about 13,000 years before the present and falling within the time range of active continental glaciers.

The youngest geologic unit in the area is the Holocene alluvium on the flood plains of the Sabine and Neches Rivers and along the intermittent tributary streams. There are also the mainly colluvial fillings of shallow drainageways, particularly on the flatter surfaces. The major flood plain deposits are represented by the Urbo-Mantachie general soil map unit. The minor intermittent stream deposits are represented by the Iuka-Mantachie general soil map unit.

The coarser alluvial material is evident in the Iuka and Melhomes soils. This coarse material is in the intermittent stream channels, possibly because of their heading into the sandy Willis Formation or because of upstream dropping and sorting.

The similarity of parent material of the Fleming and Beaumont Formations has produced fillings in local intermittent stream channels. It is here the Gladewater soils are found.

The Holocene alluvium is graded to present day sea level. It is the alluvial material deposited during and after the rise of the sea level from its low during the maximum glacial advance, possibly 17,000 or 18,000 years ago. The sea reached its present level about 3,500-4,500 years ago. The younger Deweyville deposits may represent the very earliest stages in the backfilling of the initially deepened valleys, during a time of higher rainfall and stream discharge. The Holocene alluvium probably represents the later stages under lesser rainfall and discharge conditions.

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glossary

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as—

	Inches
Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	More than 12

Base saturation. The degree to which material having cation exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation exchange capacity.

Bedding planes. Fine stratifications, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediments.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Bottom land. The normal flood plain of a stream, subject to flooding.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity, but is more precise in meaning.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Climax vegetation. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15.2 to 38.1 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

Colluvium. Soil material, rock fragments, or both moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion. *Erosion* (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Fine textured soil. Sandy clay, silty clay, and clay.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Foot slope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant not a grass or a sedge.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gilgai. Commonly a succession of microbasins and microknolls in nearly level areas or of microvalleys and microridges parallel with the slope. Typically, the microrelief of Vertisols—clayey soils having a high coefficient of expansion and contraction with changes in moisture content.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.5 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.5 centimeters) in diameter.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric and the more decomposed sapric material.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an upper case letter represents the major horizons. Numbers or lower case letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the *Soil Survey Manual.* The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue at the surface of a mineral soil.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil does not have a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the Roman numeral II precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake in inches per hour is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Large stones (in tables). Rock fragments 3 inches (7.5 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low strength. The soil is not strong enough to support loads.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Moh's scale. The relative hardness of minerals. The scale ranges from a rating of 1 for the softest (talc) to 10 for the hardest (diamond). Calcite has a hardness rating of 3 and can be scratched by copper.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Munsell notation. A designation of color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.20 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches

Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. The water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-size particles.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to insure satisfactory performance of the soil for a specific use.

Small stones (in tables). Rock fragments less than 3 inches (7.5 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 mm in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows:

	Millimeters
Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field is generally built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Tuff. A compacted deposit that is 50 percent or more volcanic ash and dust.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Recorded in the period 1951-75 at Kirbyville, Texas]

Month	Temperature						Precipitation				
				2 years in 10 will have--				2 years in 10 will have--			
	Average daily maximum	Average daily minimum	Average daily	Maximum temperature higher than--	Minimum temperature lower than--	Average number of growing degree days[1]	Average	Less than--	More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January----	62.6	39.6	51.1	80	16	144	4.79	2.30	6.81	7	.0
February---	66.2	41.4	53.8	83	20	168	4.32	2.04	6.18	6	.5
March------	72.4	47.3	59.9	87	25	325	3.67	1.35	5.54	6	.0
April------	79.6	55.7	67.7	90	33	531	4.63	1.57	7.06	5	.0
May--------	85.7	61.4	73.6	94	43	732	5.27	2.32	7.66	6	.0
June-------	91.2	67.0	79.2	99	54	876	4.64	1.94	6.83	7	.0
July-------	93.5	69.9	81.7	101	62	983	5.32	1.89	8.06	8	.0
August-----	93.5	69.5	81.5	102	59	977	3.71	1.59	5.42	7	.0
September--	89.5	65.2	77.4	98	48	822	5.14	1.61	7.97	6	.0
October----	82.1	54.3	68.2	93	35	564	3.78	.85	6.11	4	.0
November---	71.7	46.0	58.9	86	24	284	4.71	2.01	6.89	6	.0
December---	64.4	40.8	52.6	80	18	147	6.03	3.43	8.15	7	.0
Yearly:											
Average--	79.4	54.8	67.1	---	---	---	---	---	---	---	---
Extreme--	---	---	---	103	14	---	---	---	---	---	---
Total----	---	---	---	---	---	6,553	56.01	47.31	64.34	75	.5

[1] A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50° F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Recorded in the period 1951-75 at Kirbyville, Texas]

Probability	Temperature		
	24° F or lower	28° F or lower	32° F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	February 28	March 27	April 3
2 years in 10 later than--	February 19	March 19	March 29
5 years in 10 later than--	February 1	March 3	March 19
First freezing temperature in fall:			
1 year in 10 earlier than--	November 15	November 4	October 23
2 years in 10 earlier than--	November 25	November 11	October 29
5 years in 10 earlier than--	December 13	November 24	November 9

TABLE 3.--GROWING SEASON

[Recorded in the period 1951-75 at Kirbyville, Texas]

Probability	Daily minimum temperature during growing season		
	Higher than 24° F	Higher than 28° F	Higher than 32° F
	Days	Days	Days
9 years in 10	287	234	212
8 years in 10	296	244	220
5 years in 10	314	265	234
2 years in 10	335	286	248
1 year in 10	353	296	255

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Jasper County	Newton County	Total--	
		Acres	Acres	Area Acres	Extent Pct
AtA	Attoyac fine sandy loam, 0 to 3 percent slopes	3,750	630	4,380	0.3
BaB	Bernaldo-Besner complex, gently undulating	26,420	10,230	36,650	3.0
BeB	Besner-Mollville complex, gently undulating	19,650	18,140	37,790	3.1
BIB	Bienville-Alaga association, gently undulating	17,540	29,030	46,570	3.8
BOE	Bonwier-Stringtown association, hilly	1,160	4,080	5,240	0.4
BrD	Browndell-Rock outcrop complex, sloping	2,666	950	3,616	0.3
BuD	Burkeville clay, 3 to 12 percent slopes	760	5,490	6,250	0.5
CRB	Corrigan-Rayburn association, gently undulating	10,220	1,920	12,140	1.0
De	Deweyville soils, frequently flooded	60	3,310	3,370	0.3
DUB	Doucette-Boykin association, undulating	27,530	26,600	54,130	4.4
EaA	Evadale silt loam, 0 to 1 percent slopes	12,240	15,380	27,620	2.2
EdA	Evadale silty clay loam, ponded	270	1,190	1,460	0.1
EgB	Evadale-Gist complex, gently undulating	44,430	41,510	85,940	7.0
EvA	Evadale-Vidrine complex, nearly level	16,310	15,730	32,040	2.6
GAB	Gallime-Spurger association, gently undulating	70	5,860	5,930	0.5
Gw	Gladewater soils, frequently flooded	2,470	1,020	3,490	0.3
Iu	Iuka soils, frequently flooded	18,350	17,730	36,080	2.9
JaA	Jasco silt loam, 0 to 1 percent slopes	1,850	590	2,440	0.2
KJB	Kirbyville-Jasco association, gently undulating	2,890	0	2,890	0.2
KWB	Kirbyville-Waller association, gently undulating	32,710	26,750	59,460	4.8
KAE	Kisatchie-Rayburn association, hilly	10,030	8,290	18,320	1.5
LTC	Letney-Tehran association, undulating	35,420	33,150	68,570	5.6
MaB	Malbis fine sandy loam, 1 to 5 percent slopes	30,420	31,970	62,390	5.1
MKB	Malbis-Kirbyville association, gently undulating	45,930	19,780	65,710	5.3
Mn	Mantachie and Bleakwood soils, frequently flooded	10,450	19,470	29,920	2.4
Mo	Melhomes soils, frequently flooded	4,070	6,580	10,650	0.9
Mr	Mooreville soils, occasionally flooded	3,680	7,870	11,550	0.9
NEB	Newco-Urland association, gently undulating	2,950	6,600	9,550	0.8
NEE	Newco-Urland association, hilly	7,400	15,550	22,950	1.9
NfC	Nikful fine sandy loam, 0 to 8 percent slopes	2,690	890	3,580	0.3
NKB	Niwana-Kirbyville association, gently undulating	3,170	480	3,650	0.3
Oc	Ochlockonee soils, occasionally flooded	790	1,510	2,300	0.2
PIC	Pinetucky-Doucette association, undulating	18,900	38,990	57,890	4.7
RAB	Rayburn-Corrigan association, undulating	5,250	3,430	8,680	0.7
RBE	Rayburn-Kisatchie association, hilly	5,150	6,570	11,720	0.9
REB	Redco-Woodville association, gently undulating	4,310	9,750	14,060	1.1
RPB	Rogan-Pinetucky association, gently undulating	4,340	4,370	8,710	0.7
SBC	Shankler-Boykin association, undulating	1,410	3,910	5,320	0.4
SBE	Shankler-Boykin association, hilly	15,840	21,650	37,490	3.0
SMB	Spurger-Mollville association, gently undulating	8,770	4,890	13,660	1.1
STE	Stringtown-Bonwier association, hilly	2,160	3,100	5,260	0.4
SXC	Stringtown-Bonwier association, graded	1,640	2,170	3,810	0.3
TaB	Tahoula clay, 1 to 5 percent slopes	340	140	480	*
TaD	Tahoula clay, 5 to 15 percent slopes	730	380	1,110	0.1
TLE	Tehran-Letney association, hilly	49,320	74,020	123,340	10.0
Um	Urbo and Mantachie soils, frequently flooded	38,140	24,450	62,590	5.1
UPB	Urland-Pinetucky association, undulating	1,250	2,070	3,320	0.3
WAA	Waller-Evadale association, nearly level	13,110	10,670	23,780	1.9
WgC	Wiergate clay, 1 to 8 percent slopes	1,640	10,340	11,980	1.0
WTB	Woodville-Redco association, gently undulating	22,890	8,180	31,070	2.5
	Water	31,104	2,560	33,664	2.7
	Total	624,640	609,920	1,234,560	100.0

* Less than 0.1 percent.

TABLE 5.--YIELDS PER ACRE OF PASTURE

[Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the plant or the plant generally is not grown on the soil]

Soil name and map symbol	Improved bermudagrass	Common bermudagrass	Bahiagrass
	AUM*	AUM*	AUM*
AtA Attoyac	10.0	6.0	10.0
BaB Bernaldo-Besner	10.0	6.0	8.0
BeB Besner-Mollville	6.0	5.0	6.0
BIB**:			
Bienville	11.0	6.0	9.0
Alaga	6.0	---	5.0
BOE**:			
Bonwier	6.0	4.0	5.0
Stringtown	7.0	6.0	6.0
BrD Browndell-Rock outcrop	4.0	---	---
BuD Burkeville	7.0	---	5.5
CRB**:			
Corrigan	5.0	4.0	4.5
Rayburn	5.0	4.0	5.0
De Deweyville	---	---	---
DUB**:			
Doucette	10.0	8.0	8.0
Boykin	10.0	6.0	8.0
EaA Evadale	---	3.0	5.0
EdA Evadale	---	---	---
EgB Evadale-Gist	6.0	4.0	5.0
EvA Evadale-Vidrine	5.0	4.0	5.0
GAB**:			
Gallime	10.0	6.0	8.0
Spurger	8.0	6.0	8.0
Gw** Gladewater	7.0	6.0	6.0
Iu Iuka	8.0	6.0	7.0
JaA Jasco	---	---	---

See footnotes at end of table.

TABLE 5.--YIELDS PER ACRE OF PASTURE--Continued

Soil name and map symbol	Improved bermudagrass	Common bermudagrass	Bahiagrass
	AUM*	AUM*	AUM*
KJB**:			
Kirbyville	10.0	6.0	8.0
Jasco	---	---	---
KWB**:			
Kirbyville	10.0	6.0	8.0
Waller	7.0	6.0	6.0
KAE**:			
Kisatchie	5.0	3.5	4.5
Rayburn	5.0	4.0	5.0
LTC**:			
Letney	6.0	---	6.5
Tehran	5.0	---	5.0
MaB Malbis	10.0	6.0	8.0
MKB**:			
Malbis	10.0	6.0	8.0
Kirbyville	10.0	6.0	8.0
Mn**:			
Mantachie	---	---	8.0
Bleakwood	---	---	---
Mo Melhomes	---	3.0	4.0
Mr Mooreville	8.0	6.0	8.0
NEB**:			
Newco	8.0	5.0	6.0
Urland	10.0	6.0	8.0
NEE**:			
Newco	6.0	4.0	5.0
Urland	6.0	4.0	5.0
NfC Nikful	11.0	6.0	9.0
NKB**:			
Niwana	10.0	6.0	8.0
Kirbyville	10.0	6.0	8.0
Oc Ochlockonee	8.0	6.0	8.0
PIC**:			
Pinetucky	10.0	6.0	8.0
Doucette	10.0	6.0	8.0
RAB**:			
Rayburn	5.0	---	5.0
Corrigan	5.0	4.0	4.5

See footnotes at end of table.

TABLE 5.--YIELDS PER ACRE OF PASTURE--Continued

Soil name and map symbol	Improved bermudagrass	Common bermudagrass	Bahiagrass
	AUM*	AUM*	AUM*
RBE**:			
Rayburn	5.0	4.0	5.0
Kisatchie	5.0	3.5	4.5
REB**:			
Redco	6.0	5.0	5.0
Woodville	8.0	5.0	6.0
RPB**:			
Rogan	12.0	6.0	8.0
Pinetucky	10.0	6.0	8.0
SBC**:			
Shankler	6.0	4.0	5.0
Boykin	10.0	6.0	8.0
SBE**:			
Shankler	5.0	---	---
Boykin	7.0	5.0	5.0
SMB**:			
Spurger	8.0	6.0	8.0
Mollville	---	6.0	6.0
STE**:			
Stringtown	7.0	6.0	6.0
Bonwier	6.0	4.0	5.0
SXC**:			
Stringtown	---	---	---
Bonwier	---	---	---
TaB Tahoula	8.0	---	6.5
TaD Tahoula	6.0	---	6.0
TLE**:			
Tehran	5.0	---	5.0
Letney	5.0	---	5.0
Um**:			
Urbo	6.0	6.0	8.0
Mantachie	7.0	6.0	8.0
UPB**:			
Urland	10.0	6.0	8.0
Pinetucky	10.0	6.0	8.0
WAA**:			
Waller	7.0	6.0	6.0
Evadale	---	3.0	5.0
WgC Wiergate	6.0	---	5.5

See footnotes at end of table.

TABLE 5.--YIELDS PER ACRE OF PASTURE--Continued

Soil name and map symbol	Improved bermudagrass	Common bermudagrass	Bahiagrass
	AUM*	AUM*	AUM*
WTB**:			
Woodville	8.0	---	6.0
Redco	6.0	5.0	5.0

---

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 6.--CAPABILITY CLASSES AND SUBCLASSES

[Miscellaneous areas are excluded. Dashes indicate no acreage]

Class	Total acreage*	Major management concerns (Subclass)			
		Erosion (e)	Wetness (w)	Soil problem (s)	Climate (c)
		Acres	Acres	Acres	Acres
I:					
Jasper County	---	---	---	---	---
Newton County	---	---	---	---	---
II:					
Jasper County	184,783	101,489	68,385	14,909	---
Newton County	148,010	70,271	53,064	24,675	---
III:					
Jasper County	185,378	38,622	77,498	69,258	---
Newton County	209,531	62,492	74,349	72,690	---
IV:					
Jasper County	59,256	50,320	8,936	---	---
Newton County	48,994	41,354	7,640	---	---
V:					
Jasper County	29,131	---	29,131	---	---
Newton County	33,918	---	33,918	---	---
VI:					
Jasper County	85,253	82,508	2,745	---	---
Newton County	120,715	120,125	590	---	---
VII:					
Jasper County	60	---	60	---	---
Newton County	3,310	---	3,310	---	---
VIII:					
Jasper County	---	---	---	---	---
Newton County	---	---	---	---	---

* Total acreage on this table is less than the total for the county because the water areas and included soils in multi-taxa units are not included on the table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available]

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	
AtA Attoyac	1o7	Slight	Slight	Slight	Slight	Loblolly pine	100	Loblolly pine, slash pine, black walnut, sweetgum, eastern cottonwood.
						Longleaf pine	---	
						Sweetgum	---	
						Southern red oak	---	
BaB*:								
Bernaldo	1o7	Slight	Slight	Slight	Slight	Loblolly pine	98	Loblolly pine, slash pine, shortleaf pine.
						Shortleaf pine	87	
Besner	1o7	Slight	Slight	Slight	Slight	Loblolly pine	109	Loblolly pine, slash pine, eastern cottonwood, sweetgum.
						Shortleaf pine	---	
						Sweetgum	---	
						Southern red oak	---	
BeB*:								
Besner	1o7	Slight	Slight	Slight	Slight	Loblolly pine	109	Loblolly pine, slash pine, eastern cottonwood, sweetgum.
						Shortleaf pine	---	
						Sweetgum	---	
						Southern red oak	---	
Mollville	3w9	Slight	Severe	Moderate	Severe	Water oak	80	Water oak, sweetgum, loblolly pine.
						Willow oak	80	
						Sweetgum	80	
						Loblolly pine	76	
BIB*:								
Bienville	2s2	Slight	Moderate	Moderate	Moderate	Loblolly pine	90	Loblolly pine, slash pine.
						Longleaf pine	80	
						Shortleaf pine	85	
Alaga	3s2	Slight	Moderate	Moderate	Moderate	Loblolly pine	80	Slash pine, loblolly pine.
						Longleaf pine	70	
						Slash pine	80	
BOE*:								
Bonwier	4c2	Moderate	Slight	Slight	Slight	Loblolly pine	72	Loblolly pine, shortleaf pine.
						Shortleaf pine	61	
						Longleaf pine	65	
						Southern red oak	---	
Stringtown	3o7	Slight	Slight	Slight	Slight	Loblolly pine	76	Loblolly pine, slash pine.
						Longleaf pine	80	
						Sweetgum	---	
						Southern red oak	---	
BrD*:								
Browndell	5d3	Moderate	Moderate	Severe	Slight	Loblolly pine	60	Loblolly pine, shortleaf pine.
						Shortleaf pine	50	
						Longleaf pine	50	
Rock outcrop.								
BuD Burkeville	5c0	Slight	Moderate	Severe	Slight	Loblolly pine	56	(**)
						Shortleaf pine	50	
CRB*:								
Corrigan	3c8	Moderate	Moderate	Moderate	Slight	Loblolly pine	84	Loblolly pine, shortleaf pine, longleaf pine.
						Shortleaf pine	70	
						Longleaf pine	80	
Rayburn	2c8	Moderate	Moderate	Moderate	Moderate	Loblolly pine	87	Loblolly pine, slash pine.
						Shortleaf pine	80	
						Longleaf pine	74	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	
De* Deweyville	4w6	Slight	Severe	Severe	Slight	Water tupelo	---	(**)
						Baldcypress	---	
						Swamp tupelo	---	
						Blackgum	---	
DUB*:								
Doucette	2s2	Slight	Slight	Moderate	Moderate	Loblolly pine	92	Loblolly pine, slash pine.
						Shortleaf pine	75	
						Longleaf pine	86	
Boykin	2s2	Slight	Slight	Moderate	Moderate	Loblolly pine	92	Loblolly pine, slash pine.
						Shortleaf pine	76	
						Longleaf pine	---	
						Slash pine	---	
EaA Evadale	1w9	Slight	Severe	Moderate	Moderate	Loblolly pine	105	Loblolly pine, slash pine.
						Water oak	---	
						Slash pine	88	
EdA Evadale	5w0	Slight	Severe	Severe	Severe	Red maple	---	Water oak.
						Water oak	60	
EgB*:								
Evadale	1w9	Slight	Severe	Moderate	Moderate	Loblolly pine	105	Loblolly pine, slash pine.
						Water oak	---	
						Slash pine	88	
Gist	1o7	Slight	Slight	Slight	Slight	Loblolly pine	119	Loblolly pine, slash pine, sweetgum.
						Slash pine	94	
						Sweetgum	---	
EvA*:								
Evadale	1w9	Slight	Severe	Moderate	Moderate	Loblolly pine	105	Loblolly pine, slash pine.
						Water oak	---	
						Slash pine	88	
Vidrine	1w9	Slight	Severe	Slight	Moderate	Loblolly pine	100	Loblolly pine, slash pine.
						Slash pine	90	
						Sweetgum	---	
GAB*:								
Gallime	1o7	Slight	Slight	Slight	Slight	Loblolly pine	100	Loblolly pine, slash pine, sweetgum.
						Shortleaf pine	---	
						Southern red oak	---	
						Sweetgum	---	
Spurger	1w2	Slight	Moderate	Slight	Moderate	Loblolly pine	101	Loblolly pine, slash pine.
						Shortleaf pine	---	
						Southern red oak	---	
						Sweetgum	---	
Gw* Gladewater	2w6	Slight	Severe	Moderate	Severe	Water oak	90	Water oak, sweetgum.
						Willow oak	90	
Iu* Iuka	1w8	Slight	Moderate	Moderate	Severe	Loblolly pine	100	Loblolly pine, eastern cottonwood, yellow-poplar.
						Sweetgum	100	
						Eastern cottonwood	105	
						Water oak	100	
JaA Jasco	5w0	Slight	Severe	Severe	Severe	Shortleaf pine	---	(**)
						Loblolly pine	---	
						Slash pine	54	
KJB*:								
Kirbyville	1w2	Slight	Moderate	Slight	Severe	Loblolly pine	105	Slash pine, loblolly pine.
						Shortleaf pine	---	
						Slash pine	98	
						Longleaf pine	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	
KJB*:								
Jasco	5w0	Slight	Severe	Severe	Severe	Shortleaf pine	---	(**)
						Loblolly pine	---	
						Slash pine	54	
KWB*:								
Kirbyville	1w2	Slight	Moderate	Slight	Severe	Loblolly pine	105	Slash pine, loblolly pine.
						Shortleaf pine	---	
						Slash pine	98	
						Longleaf pine	---	
Waller	2w9	Slight	Severe	Severe	Severe	Loblolly pine	80	Loblolly pine, slash pine.
						Water oak	80	
						Sweetgum	80	
						Shortleaf pine	70	
						Longleaf pine	70	
KAE*:								
Kisatchie	3c8	Moderate	Moderate	Moderate	Slight	Loblolly pine	80	Loblolly pine, slash pine.
						Slash pine	75	
						Longleaf pine	---	
						Shortleaf pine	---	
Rayburn	3c8	Moderate	Moderate	Moderate	Moderate	Loblolly pine	82	Loblolly pine, slash pine.
						Shortleaf pine	80	
						Longleaf pine	74	
LTC*:								
Letney	2s3	Slight	Moderate	Moderate	Moderate	Loblolly pine	90	Loblolly pine, slash pine.
						Shortleaf pine	---	
						Longleaf pine	76	
Tehran	3s3	Slight	Moderate	Severe	Moderate	Loblolly pine	83	Loblolly pine, slash pine.
						Shortleaf pine	---	
						Longleaf pine	---	
MaB Malbis	1o7	Slight	Slight	Slight	Moderate	Loblolly pine	98	Loblolly pine, slash pine, sweetgum.
						Slash pine	97	
						Longleaf pine	93	
						Sweetgum	---	
MKB*:								
Malbis	1o7	Slight	Slight	Slight	Moderate	Loblolly pine	98	Loblolly pine, slash pine, sweetgum.
						Slash pine	97	
						Longleaf pine	93	
						Sweetgum	---	
Kirbyville	1w2	Slight	Moderate	Slight	Severe	Loblolly pine	105	Slash pine, loblolly pine.
						Shortleaf pine	---	
						Slash pine	98	
						Longleaf pine	---	
Mn*:								
Mantachie	1w6	Slight	Severe	Severe	Severe	Eastern cottonwood	90	Sweetgum, loblolly pine.
						Loblolly pine	98	
						Sweetgum	95	
Bleakwood	1w6	Slight	Severe	Severe	Severe	Water oak	---	Sweetgum, loblolly pine.
						Willow oak	---	
						Sweetgum	---	
						Loblolly pine	102	
Mo* Melhomes	2w9	Slight	Severe	Severe	Severe	Loblolly pine	90	Slash pine, loblolly pine.
Mr* Mooreville	1w8	Slight	Moderate	Moderate	Moderate	Eastern cottonwood	105	Eastern cottonwood, loblolly pine, sweetgum.
						Loblolly pine	95	
						Sweetgum	100	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	
NEB*,NEE*:								
Newco	2c8	Moderate	Slight	Slight	Moderate	Loblolly pine	88	Loblolly pine, slash pine, sweetgum.
						Shortleaf pine	80	
						Sweetgum	---	
						Southern red oak	---	
Urland	2o1	Slight	Slight	Slight	Slight	Loblolly pine	86	Loblolly pine, slash pine.
						Shortleaf pine	79	
NfC Nikful	1w2	Moderate	Moderate	Moderate	Moderate	Longleaf pine	89	Loblolly pine, slash pine.
						Loblolly pine	---	
NKB*:								
Niwana	1o7	Slight	Slight	Slight	Slight	Loblolly pine	96	Loblolly pine, slash pine, sweetgum.
						Longleaf pine	---	
						Sweetgum	---	
Kirbyville	1w2	Slight	Moderate	Slight	Severe	Loblolly pine	105	Slash pine, loblolly pine.
						Shortleaf pine	---	
						Slash pine	98	
						Longleaf pine	---	
Oc* Ochlockonee	1o7	Slight	Slight	Slight	Moderate	Eastern cottonwood	100	Loblolly pine, eastern cottonwood.
						Loblolly pine	100	
						Slash pine	100	
						Sweetgum	90	
						Water oak	80	
PIC*:								
Pinetucky	2o1	Slight	Slight	Slight	Slight	Loblolly pine	95	Loblolly pine, longleaf pine, slash pine.
						Longleaf pine	82	
						Slash pine	---	
Doucette	2s2	Slight	Slight	Moderate	Moderate	Loblolly pine	92	Loblolly pine, slash pine.
						Shortleaf pine	75	
						Longleaf pine	86	
RAB*:								
Rayburn	2c8	Moderate	Moderate	Moderate	Moderate	Loblolly pine	87	Loblolly pine, slash pine.
						Shortleaf pine	80	
						Longleaf pine	74	
Corrigan	3c8	Moderate	Moderate	Moderate	Slight	Loblolly pine	84	Loblolly pine, shortleaf pine, longleaf pine.
						Shortleaf pine	70	
						Longleaf pine	80	
RBE*:								
Rayburn	3c8	Moderate	Moderate	Moderate	Moderate	Loblolly pine	82	Loblolly pine, slash pine.
						Shortleaf pine	80	
						Longleaf pine	74	
Kisatchie	3c8	Moderate	Moderate	Moderate	Slight	Loblolly pine	80	Loblolly pine, slash pine.
						Slash pine	75	
						Longleaf pine	---	
						Shortleaf pine	---	
REB*:								
Redco	3c8	Slight	Moderate	Moderate	Slight	Loblolly pine	80	Loblolly pine, slash pine, sweetgum.
						Shortleaf pine	70	
						Water oak	70	
						Sweetgum	---	
Woodville	2c8	Slight	Moderate	Slight	Slight	Loblolly pine	90	Loblolly pine, slash pine.
						Shortleaf pine	78	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	
RPB*:								
Rogan	3o1	Slight	Slight	Slight	Slight	Loblolly pine	85	Loblolly pine, slash pine.
						Longleaf pine	70	
						Sweetgum	---	
						Southern red oak	---	
Pinetucky	2o1	Slight	Slight	Slight	Slight	Loblolly pine	95	Loblolly pine, longleaf pine, slash pine.
						Longleaf pine	82	
						Slash pine	---	
SBC*, SBE*:								
Shankler	2s3	Slight	Moderate	Severe	Moderate	Loblolly pine	92	Loblolly pine.
						Shortleaf pine	---	
Boykin	2s2	Slight	Slight	Moderate	Moderate	Loblolly pine	92	Loblolly pine, slash pine.
						Shortleaf pine	76	
						Longleaf pine	---	
						Slash pine	---	
SMB*:								
Spurger	1w2	Slight	Moderate	Slight	Moderate	Loblolly pine	101	Loblolly pine, slash pine.
						Shortleaf pine	---	
						Southern red oak	---	
						Sweetgum	---	
Mollville	3w9	Slight	Severe	Moderate	Severe	Water oak	80	Water oak, sweetgum, loblolly pine.
						Willow oak	80	
						Sweetgum	80	
						Loblolly pine	76	
STE*:								
Stringtown	3o7	Slight	Slight	Slight	Slight	Loblolly pine	76	Loblolly pine, slash pine.
						Longleaf pine	80	
						Sweetgum	---	
						Southern red oak	---	
Bonwier	4c2	Moderate	Slight	Slight	Slight	Loblolly pine	72	Loblolly pine, shortleaf pine.
						Shortleaf pine	61	
						Longleaf pine	65	
						Southern red oak	---	
SXC*:								
Stringtown	4c2	Severe	Moderate	Moderate	Slight	Loblolly pine	70	Loblolly pine.
						Shortleaf pine	---	
Bonwier	4c2	Severe	Moderate	Moderate	Slight	Loblolly pine	70	Loblolly pine.
						Shortleaf pine	---	
TaB, TaD Tahoula	4c2	Slight	Moderate	Moderate	Moderate	Shortleaf pine	---	Loblolly pine, shortleaf pine, slash pine.
						Loblolly pine	70	
						Longleaf pine	---	
TLE*:								
Tehran	3s3	Slight	Moderate	Severe	Moderate	Loblolly pine	83	Loblolly pine, slash pine.
						Shortleaf pine	---	
						Longleaf pine	83	
Letney	2s3	Slight	Moderate	Moderate	Moderate	Loblolly pine	90	Loblolly pine, slash pine.
						Shortleaf pine	---	
						Longleaf pine	76	
Um*:								
Urbo	1w6	Slight	Severe	Moderate	Severe	Eastern cottonwood	108	Eastern cottonwood, sweetgum, loblolly pine.
						Sweetgum	98	
Mantachie	1w6	Slight	Severe	Severe	Severe	Eastern cottonwood	90	Sweetgum, loblolly pine, eastern cottonwood.
						Loblolly pine	98	
						Sweetgum	95	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	
UPB*:								
Urland	2o1	Slight	Slight	Slight	Slight	Loblolly pine	86	Loblolly pine, slash pine.
						Shortleaf pine	79	
Pinetucky	2o1	Slight	Slight	Slight	Slight	Loblolly pine	95	Loblolly pine, longleaf pine, slash pine.
						Longleaf pine	82	
						Slash pine	---	
WAA*:								
Waller	2w9	Slight	Severe	Severe	Severe	Loblolly pine	86	Loblolly pine, slash pine.
						Water oak	80	
						Sweetgum	80	
Evadale	1w9	Slight	Severe	Moderate	Moderate	Loblolly pine	105	Loblolly pine, slash pine.
						Water oak	---	
						Slash pine	88	
WgC Wiergate	2c8	Slight	Moderate	Moderate	Moderate	Loblolly pine	89	Loblolly pine, shortleaf pine, slash pine.
						Shortleaf pine	---	
						Sweetgum	---	
WTB*:								
Woodville	2c8	Slight	Moderate	Slight	Slight	Loblolly pine	90	Loblolly pine, slash pine.
						Shortleaf pine	78	
Redco	3c8	Slight	Moderate	Moderate	Slight	Loblolly pine	80	Loblolly pine, slash pine, sweetgum.
						Shortleaf pine	70	
						Water oak	70	
						Sweetgum	---	

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* See description of the map unit for composition and behavior characteristics of the map unit.

** Because of low site index and poor growth of pine trees on the Deweyville, Jasco, and Burkeville soils, trees to plant are not shown for these soils.

TABLE 8.--WOODLAND UNDERSTORY VEGETATION

[Only the soils suitable for production of commercial trees are listed]

Soil name and map symbol	Total production		Characteristic vegetation	Composition
	Kind of year	Dry weight		
		Lb/acre		Pct
AtA	Favorable	1,300	Pinehill bluestem	55
Attoyac	Normal	1,050	Slender bluestem	5
	Unfavorable	800	Longleaf uniola	5
			Splitbeard bluestem	5
			Waxmyrtle	5
			Carolina jessamine	5
			Greenbrier	5
			Yaupon	5
BaB*:				
Bernaldo	Favorable	1,300	Pinehill bluestem	55
	Normal	1,050	Slender bluestem	5
	Unfavorable	800	Longleaf uniola	5
			Splitbeard bluestem	5
			Waxmyrtle	5
			Carolina jessamine	5
			Greenbrier	5
			Yaupon	5
Besner	Favorable	1,300	Pinehill bluestem	55
	Normal	1,050	Slender bluestem	5
	Unfavorable	800	Longleaf uniola	5
			Splitbeard bluestem	5
			Waxmyrtle	5
			Carolina jessamine	5
			Greenbrier	5
			Yaupon	5
			American beautyberry	5
BeB*:				
Besner	Favorable	1,300	Pinehill bluestem	55
	Normal	1,050	Slender bluestem	5
	Unfavorable	800	Longleaf uniola	5
			Splitbeard bluestem	5
			Waxmyrtle	5
			Carolina jessamine	5
			Greenbrier	5
			Yaupon	5
			American beautyberry	5
Mollville	Favorable	2,000	Pinehill bluestem	35
	Normal	1,750	Waxmyrtle	10
	Unfavorable	1,400	Splitbeard bluestem	5
			Sedge	5
			Panicum	5
			Switchgrass	5
			Longleaf uniola	5
			Greenbrier	5
			Carolina jessamine	5
			Blackgum	5
BIB*:				
Bienville	Favorable	1,450	Pinehill bluestem	50
	Normal	1,200	Fine-leaf bluestem	5
	Unfavorable	900	Splitbeard bluestem	5
			Threeawn	5
			Pineywoods dropseed	5
			Poison-ivy	5
			Hawthorn	5
			Brackenfern	5
			American beautyberry	5

See footnote at end of table.

TABLE 8.--WOODLAND UNDERSTORY VEGETATION--Continued

Soil name and map symbol	Total production		Characteristic vegetation	Composition
	Kind of year	Dry weight		
		Lb/acre		Pct
BIB*:				
Alaga	Favorable	1,500	Pinehill bluestem	40
	Normal	1,350	Splitbeard bluestem	10
	Unfavorable	950	Threeawn	5
			Fine-leaf bluestem	5
			Tickclover	5
			Brackenfern	5
			Bluejack oak	5
			Pineywoods dropseed	5
BOE*:				
Bonwier	Favorable	2,250	Pinehill bluestem	55
	Normal	1,900	Slender bluestem	5
	Unfavorable	1,400	Brownseed paspalum	5
			Sedge	5
			Splitbeard bluestem	5
			Southern bayberry	5
			Switchgrass	5
Stringtown	Favorable	1,500	Pinehill bluestem	60
	Normal	1,350	Slender bluestem	5
	Unfavorable	950	Pineywoods dropseed	5
			Yaupon	5
			American beautyberry	5
BrD*:				
Browndell	Favorable	500	Pinehill bluetem	50
	Normal	400	Fine-leaf bluestem	5
	Unfavorable	325	Splitbeard bluestem	5
			Threeawn	5
			Yaupon	5
			Hawthorn	5
			Pineywoods dropseed	5
Rock outcrop.				
BuD Burkeville	Favorable	750	Pinehill bluestem	85
	Normal	600	Threeawn	5
	Unfavorable	480	Hawthorn	5
			Yaupon	5
CRB*:				
Corrigan	Favorable	2,000	Pinehill bluestem	50
	Normal	1,800	Slender bluestem	5
	Unfavorable	1,350	Longleaf uniola	5
			Splitbeard bluestem	5
			Switchgrass	5
			Sedge	5
			Pineywoods dropseed	5
Rayburn	Favorable	2,000	Pinehill bluestem	50
	Normal	1,800	Slender bluestem	5
	Unfavorable	1,350	Longleaf uniola	5
			Splitbeard bluestem	5
			Switchgrass	5
			Sedge	5
			Pineywoods dropseed	5
			Waxmyrtle	5
			Brownseed paspalum	5
De* Deweyville	Favorable	120	Sedge	30
	Normal	100	Swamp tupelo	20
	Unfavorable	80	Panicum	10
			Smartweed	10
			Rush	5

See footnote at end of table.

TABLE 8.--WOODLAND UNDERSTORY VEGETATION--Continued

Soil name and map symbol	Total production		Characteristic vegetation	Composition
	Kind of year	Dry weight		
		Lb/acre		Pct
DUB*:				
Doucette	Favorable	1,450	Pinehill bluestem	50
	Normal	1,200	Splitbeard bluestem	5
	Unfavorable	900	Longleaf uniola	5
			Longspike tridens	5
			Tickclover	5
			American beautyberry	5
			Poison-ivy	5
			Brackenfern	5
Boykin	Favorable	1,450	Pinehill bluestem	45
	Normal	1,200	Pineywoods dropseed	5
	Unfavorable	900	Splitbeard bluestem	5
			Longleaf uniola	5
			Tickclover	5
			American beautyberry	5
			Brackenfern	5
			Poison-ivy	5
EaA Evadale	Favorable	1,850	Pinehill bluestem	40
	Normal	1,500	Carolina jessamine	10
	Unfavorable	1,100	Longleaf uniola	5
			Spreading panicum	5
			Panicum	5
			Brownseed paspalum	5
			Sedge	5
			Splitbeard bluestem	5
			Greenbrier	5
			Waxmyrtle	5
EdA Evadale	Favorable	3,000	Pinehill bluestem	40
	Normal	2,500	Sedge	15
	Unfavorable	1,875	Carolina jointtail	10
			Panicum	10
			Bushy bluestem	5
			Switchgrass	5
			Threeawn	5
			Florida paspalum	5
			St. Andrews cross	5
EgB*:				
Evadale	Favorable	1,850	Pinehill bluestem	40
	Normal	1,500	Carolina jessamine	10
	Unfavorable	1,100	Longleaf uniola	5
			Spreading panicum	5
			Panicum	5
			Brownseed paspalum	5
			Sedge	5
			Splitbeard bluestem	5
			Greenbrier	5
			Waxmyrtle	5
Gist	Favorable	1,300	Pinehill bluestem	55
	Normal	1,050	Slender bluestem	5
	Unfavorable	800	Longleaf uniola	5
			Splitbeard bluestem	5
			Waxmyrtle	5
			Carolina jessamine	5
			Greenbrier	5
			Yaupon	5
			American beautyberry	5

See footnote at end of table.

TABLE 8.--WOODLAND UNDERSTORY VEGETATION--Continued

Soil name and map symbol	Total production		Characteristic vegetation	Composition
	Kind of year	Dry weight		
		Lb/acre		Pct
EvA*:				
Evadale	Favorable	1,850	Pinehill bluestem	40
	Normal	1,500	Carolina jessamine	10
	Unfavorable	1,100	Longleaf uniola	5
			Spreading panicum	5
			Panicum	5
			Brownseed paspalum	5
			Splitbeard bluestem	5
			Greenbrier	5
			Waxmyrtle	5
Vidrine	Favorable	1,800	Pinehill bluestem	40
	Normal	1,500	Carolina jessamine	10
	Unfavorable	1,100	Longleaf uniola	5
			Spreading panicum	5
			Panicum	5
			Brownseed paspalum	5
			Sedge	5
			Splitbeard bluestem	5
			Greenbrier	5
			Waxmyrtle	5
GAB*:				
Gallime	Favorable	1,300	Pinehill bluestem	55
	Normal	1,050	Longleaf uniola	5
	Unfavorable	800	American beautyberry	5
			Carolina jessamine	5
			Greenbrier	5
			Slender bluestem	5
			Waxmyrtle	5
			Yaupon	5
Spurger	Favorable	1,850	Pinehill bluestem	40
	Normal	1,500	Carolina jessamine	10
	Unfavorable	1,100	Splitbeard bluestem	5
			Sedge	5
			Panicum	5
			Longleaf uniola	5
			Waxmyrtle	5
			Yaupon	5
			Greenbrier	5
			Brownseed paspalum	5
Gw*	Favorable	1,500	Switchcane	20
Gladewater	Normal	1,200	Sedge	10
	Unfavorable	900	Pinehill bluestem	10
			Panicum	5
			Splitbeard bluestem	5
			Spreading panicum	5
			St. Andrews cross	5
			Blackberry	5
Iu*	Favorable	1,850	Pinehill bluestem	40
Iuka	Normal	1,500	Beaked panicum	5
	Unfavorable	1,100	Spreading panicum	5
			Splitbeard bluestem	5
			Sedge	5
			Panicum	5
			Longleaf uniola	5
			Greenbrier	5

See footnote at end of table.

TABLE 8.--WOODLAND UNDERSTORY VEGETATION--Continued

Soil name and map symbol	Total production		Characteristic vegetation	Composition
	Kind of year	Dry weight		
		Lb/acre		Pct
JaA: Jasco	Favorable Normal Unfavorable	3,000 2,500 1,800	Pinehill bluestem Sedge Carolina jointtail Panicum Switchgrass St.-Johnswort Threeawn Bushy bluestem Florida paspalum	40 15 10 10 5 5 5 5 5
KJB*: Kirbyville	Favorable Normal Unfavorable	1,800 1,500 900	Pinehill bluestem Carolina jessamine Longleaf uniola Brownseed paspalum Waxmyrtle Splitbeard bluestem Panicum Sedge Yaupon Greenbrier	40 10 5 5 5 5 5 5 5 5
Jasco	Favorable Normal Unfavorable	3,000 2,500 1,800	Pinehill bluestem Sedge Carolina jointtail Panicum Switchgrass St.-Johnswort Threeawn Bushy bluestem Florida paspalum	40 15 10 10 5 5 5 5 5
KWB*: Kirbyville	Favorable Normal Unfavorable	1,800 1,500 900	Pinehill bluestem Carolina jessamine Longleaf uniola Brownseed paspalum Waxmyrtle Splitbeard bluestem Panicum Sedge Yaupon Greenbrier	40 10 5 5 5 5 5 5 5 5
Waller	Favorable Normal Unfavorable	1,950 1,650 1,250	Pinehill bluestem Beaked panicum Sedge Virginia wildrye Brownseed paspalum Carolina jessamine Greenbrier Waxmyrtle Longleaf uniola Panicum	40 10 10 5 5 5 5 5 5 5
KAE*: Kisatchie	Favorable Normal Unfavorable	2,000 1,800 1,350	Pinehill bluestem Slender bluestem Longleaf uniola Splitbeard bluestem Switchgrass Sedge Pineywoods dropseed Waxmyrtle Brownseed paspalum	50 5 5 5 5 5 5 5 5

See footnote at end of table.

TABLE 8.--WOODLAND UNDERSTORY VEGETATION--Continued

Soil name and map symbol	Total production		Characteristic vegetation	Composition
	Kind of year	Dry weight		
		Lb/acre		Pct
KAE*:				
Rayburn	Favorable	2,000	Pinehill bluestem	50
	Normal	1,800	Slender bluestem	5
	Unfavorable	1,350	Longleaf uniola	5
			Splitbeard bluestem	5
			Switchgrass	5
			Sedge	5
			Pineywoods dropseed	5
			Waxmyrtle	5
			Brownseed paspalum	5
LTC*:				
Letney	Favorable	1,450	Pinehill bluestem	50
	Normal	1,200	Longleaf uniola	5
	Unfavorable	900	Panicum	5
			Threeawn	5
			Fine-leaf bluestem	5
			Splitbeard bluestem	5
			Pineywoods dropseed	5
			Tickclover	5
			Brackenfern	5
			American beautyberry	5
Tehran	Favorable	1,500	Pinehill bluestem	40
	Normal	1,300	Splitbeard bluestem	10
	Unfavorable	950	Threeawn	10
			Fine-leaf bluestem	5
			Panicum	5
			Tickclover	5
			Brackenfern	5
			Pineywoods dropseed	5
MaB*	Favorable	1,300	Pinehill bluestem	55
Malbis	Normal	1,100	Splitbeard bluestem	5
	Unfavorable	800	Pineywoods dropseed	5
			Brownseed paspalum	5
			Threeawn	5
			Greenbrier	5
			Yaupon	5
MKB*:				
Malbis	Favorable	1,300	Pinehill bluestem	55
	Normal	1,100	Splitbeard bluestem	5
	Unfavorable	800	Pineywoods dropseed	5
			Brownseed paspalum	5
			Threeawn	5
			Greenbrier	5
			Yaupon	5
Kirbyville	Favorable	1,800	Pinehill bluestem	40
	Normal	1,500	Carolina jessamine	10
	Unfavorable	900	Longleaf uniola	5
			Brownseed paspalum	5
			Waxmyrtle	5
			Splitbeard bluestem	5
			Panicum	5
			Sedge	5
			Yaupon	5
			Greenbrier	5

See footnote at end of table.

TABLE 8.--WOODLAND UNDERSTORY VEGETATION--Continued

Soil name and map symbol	Total production		Characteristic vegetation	Composition
	Kind of year	Dry weight		
		Lb/acre		Pct
Mn*:				
Mantachie	Favorable	1,600	Pinehill bluestem	30
	Normal	1,400	Switchcane	20
	Unfavorable	1,000	Sedge	10
			Splitbeard bluestem	5
			Panicum	5
			Longleaf uniola	5
			Spreading panicum	5
			Waxmyrtle	5
			Greenbrier	5
			Florida paspalum	5
Bleakwood	Favorable	1,600	Pinehill bluestem	30
	Normal	1,400	Switchcane	20
	Unfavorable	1,000	Sedge	10
			Splitbeard bluestem	5
			Panicum	5
			Longleaf uniola	5
			Spreading panicum	5
			Waxmyrtle	5
			Greenbrier	5
			Florida paspalum	5
Mo*	Favorable	1,500	Pinehill bluestem	40
Melhomes	Normal	1,250	Waxmyrtle	5
	Unfavorable	950	Sedge	5
			Spreading panicum	5
			Panicum	5
			Splitbeard bluestem	5
			Beaked panicum	5
			St.-Johnswort	5
			Red maple	5
			Blackgum	5
Mr*	Favorable	1,850	Pinehill bluestem	50
Mooreville	Normal	1,500	Splitbeard bluestem	5
	Unfavorable	1,100	Sedge	5
			Longleaf uniola	5
			Carolina jessamine	5
			Waxmyrtle	5
			Greenbrier	5
			Yaupon	5
NEB*, NEE*:				
Newco	Favorable	1,950	Pinehill bluestem	50
	Normal	1,650	Longleaf uniola	5
	Unfavorable	1,250	Slender bluestem	5
			Pineywoods dropseed	5
			Brownseed paspalum	5
			Sedge	5
			Waxmyrtle	5
Urland	Favorable	1,500	Pinehill bluestem	60
	Normal	1,200	Slender bluestem	5
	Unfavorable	950	Pineywoods dropseed	5
			Brownseed paspalum	5
			Yaupon	5
			American beautyberry	5
NfC	Favorable	1,850	Pinehill bluestem	40
Nikful	Normal	1,500	Carolina jessamine	10
	Unfavorable	1,100	Longleaf uniola	5
			Panicum	5
			Sedge	5
			Splitbeard bluestem	5
			Brownseed paspalum	5
			Greenbrier	5
			Yaupon	5
			Waxmyrtle	5

See footnote at end of table.

TABLE 8.--WOODLAND UNDERSTORY VEGETATION--Continued

Soil name and map symbol	Total production		Characteristic vegetation	Composition
	Kind of year	Dry weight		
		Lb/acre		Pct
NKB*:				
Niwana	Favorable	1,300	Pinehill bluestem	55
	Normal	1,100	Slender bluestem	5
	Unfavorable	800	Longleaf uniola	5
			Splitbeard bluestem	5
			Waxmyrtle	5
			Carolina jessamine	5
			Greenbrier	5
			Yaupon	5
			American beautyberry	5
Kirbyville	Favorable	1,800	Pinehill bluestem	40
	Normal	1,500	Carolina jessamine	10
	Unfavorable	900	Longleaf uniola	5
			Brownseed paspalum	5
			Waxmyrtle	5
			Splitbeard bluestem	5
			Panicum	5
			Sedge	5
			Yaupon	5
			Greenbrier	5
Oc* Ochlockonee	Favorable	1,300	Pinehill bluestem	55
	Normal	1,100	Slender bluestem	5
	Unfavorable	800	Splitbeard bluestem	5
			Longleaf uniola	5
			Waxmyrtle	5
			Carolina jessamine	5
			Greenbrier	5
			Yaupon	5
			American beautyberry	5
PIC*:				
Pinetucky	Favorable	1,450	Pinehill bluestem	60
	Normal	1,200	Slender bluestem	5
	Unfavorable	900	Carolina jessamine	5
			Yaupon	5
			Greenbrier	5
Doucette	Favorable	1,450	Pinehill bluestem	50
	Normal	1,200	Splitbeard bluestem	5
	Unfavorable	900	Longleaf uniola	5
			Longspike tridens	5
			Tickclover	5
			American beautyberry	5
			Poison-ivy	5
			Brackenfern	5
RAB*:				
Rayburn	Favorable	2,000	Pinehill bluestem	50
	Normal	1,800	Slender bluestem	5
	Unfavorable	1,350	Longleaf uniola	5
			Splitbeard bluestem	5
			Switchgrass	5
			Sedge	5
			Pineywoods dropseed	5
			Waxmyrtle	5
			Brownseed paspalum	5
Corrigan	Favorable	2,000	Pinehill bluestem	50
	Normal	1,800	Slender bluestem	5
	Unfavorable	1,350	Longleaf uniola	5
			Splitbeard bluestem	5
			Switchgrass	5
			Sedge	5
			Pineywoods dropseed	5

See footnote at end of table.

TABLE 8.--WOODLAND UNDERSTORY VEGETATION--Continued

Soil name and map symbol	Total production		Characteristic vegetation	Composition
	Kind of year	Dry weight		
		Lb/acre		Pct
RBE*:				
Rayburn	Favorable	2,000	Pinehill bluestem	50
	Normal	1,800	Slender bluestem	5
	Unfavorable	1,350	Longleaf uniola	5
			Splitbeard bluestem	5
			Switchgrass	5
			Sedge	5
			Pineywoods dropseed	5
			Waxmyrtle	5
			Brownseed paspalum	5
Kisatchie	Favorable	2,000	Pinehill bluestem	50
	Normal	1,800	Slender bluestem	5
	Unfavorable	1,350	Longleaf uniola	5
			Splitbeard bluestem	5
			Switchgrass	5
			Sedge	5
			Pineywoods dropseed	5
			Waxmyrtle	5
			Brownseed paspalum	5
REB*:				
Redco	Favorable	2,000	Pinehill bluestem	50
	Normal	1,800	Slender bluestem	5
	Unfavorable	1,350	Splitbeard bluestem	5
			Sedge	5
			Switchgrass	5
			Longleaf uniola	5
			Pineywoods dropseed	5
			Brownseed paspalum	5
			Waxmyrtle	5
Woodville	Favorable	1,950	Pinehill bluestem	50
	Normal	1,650	Slender bluestem	5
	Unfavorable	1,250	Sedge	5
			Longleaf uniola	5
			Pineywoods dropseed	5
			Brownseed paspalum	5
RPB*:				
Rogan	Favorable	1,500	Pinehill bluestem	60
	Normal	1,350	Slender bluestem	5
	Unfavorable	900	Pineywoods dropseed	5
			Yaupon	5
			American beautyberry	5
Pinetucky	Favorable	1,450	Pinehill bluestem	60
	Normal	1,200	Slender bluestem	5
	Unfavorable	900	Carolina jessamine	5
			Yaupon	5
			Greenbrier	5
SBC*, SBE*:				
Shankler	Favorable	1,450	Pinehill bluestem	50
	Normal	1,200	Splitbeard bluestem	5
	Unfavorable	900	Threeawn	5
			Pineywoods dropseed	5
			Poison-ivy	5
			Tickclover	5
			Brackenfern	5
			American beautyberry	5

See footnote at end of table.

TABLE 8.--WOODLAND UNDERSTORY VEGETATION--Continued

Soil name and map symbol	Total production		Characteristic vegetation	Composition
	Kind of year	Dry weight		
		Lb/acre		Pct
SBC*, SBE*:				
Boykin	Favorable	1,450	Pinehill bluestem	45
	Normal	1,200	Pineywoods dropseed	5
	Unfavorable	900	Splitbeard bluestem	5
			Longleaf uniola	5
			Tickclover	5
			American beautyberry	5
			Brackenfern	5
			Poison-ivy	5
SMB*:				
Spurger	Favorable	1,850	Pinehill bluestem	40
	Normal	1,500	Carolina jessamine	10
	Unfavorable	1,100	Splitbeard bluestem	5
			Sedge	5
			Panicum	5
			Longleaf uniola	5
			Waxmyrtle	5
			Yaupon	5
			Greenbrier	5
			Brownseed paspalum	5
Mollville	Favorable	2,000	Pinehill bluestem	35
	Normal	1,750	Waxmyrtle	10
	Unfavorable	1,400	Splitbeard bluestem	5
			Sedge	5
			Panicum	5
			Switchgrass	5
			Longleaf uniola	5
			Greenbrier	5
			Carolina jessamine	5
			Blackgum	5
STE*:				
Stringtown	Favorable	1,500	Pinehill bluestem	60
	Normal	1,350	Slender bluestem	5
	Unfavorable	950	Pineywoods dropseed	5
			Yaupon	5
			American beautyberry	5
Bonwier	Favorable	2,250	Pinehill bluestem	55
	Normal	1,900	Slender bluestem	5
	Unfavorable	1,400	Brownseed paspalum	5
			Sedge	5
			Splitbeard bluestem	5
			Waxmyrtle	5
			Switchgrass	5
SXC*:				
Stringtown	Favorable	2,000	Pinehill bluestem	55
	Normal	1,700	Greenbrier	5
	Unfavorable	1,200	Panicum	5
			Slender bluestem	5
			Splitbeard bluestem	5
			Huckleberry	5
			Brownseed paspalum	5
			Sedge	5
			Waxmyrtle	5
Bonwier	Favorable	2,000	Pinehill bluestem	55
	Normal	1,700	Greenbrier	5
	Unfavorable	1,200	Panicum	5
			Slender bluestem	5
			Splitbeard bluestem	5
			Huckleberry	5
			Brownseed paspalum	5
			Sedge	5
			Waxmyrtle	5

See footnote at end of table.

TABLE 8.--WOODLAND UNDERSTORY VEGETATION--Continued

Soil name and map symbol	Total production		Characteristic vegetation	Composition
	Kind of year	Dry weight		
		Lb/acre		Pct
TaB, TaD Tahoula	Favorable	2,250	Pinehill bluestem	55
	Normal	1,900	Slender bluestem	5
	Unfavorable	1,400	Splitbeard bluestem	5
			Sedge	5
			Switchgrass	5
			Brownseed paspalum	5
			Waxmyrtle	5
TLE*: Tehran	Favorable	1,500	Pinehill bluestem	40
	Normal	1,300	Splitbeard bluestem	10
	Unfavorable	950	Threeawn	10
			Fine-leaf bluestem	5
			Panicum	5
			Tickclover	5
			Brackenfern	5
			Pineywoods dropseed	5
Letney	Favorable	1,450	Pinehill bluestem	50
	Normal	1,200	Longleaf uniola	5
	Unfavorable	900	Panicum	5
			Threeawn	5
			Fine-leaf bluestem	5
			Splitbeard bluestem	5
			Pineywoods dropseed	5
			Tickclover	5
			Brackenfern	5
			American beautyberry	5
Um*: Urbo	Favorable	1,600	Pinehill bluestem	30
	Normal	1,400	Switchcane	20
	Unfavorable	1,000	Sedge	10
			Splitbeard bluestem	5
			Spreading panicum	5
			Longleaf uniola	5
			Waxmyrtle	5
			Greenbrier	5
Mantachie	Favorable	1,600	Pinehill bluestem	30
	Normal	1,400	Switchcane	20
	Unfavorable	1,000	Sedge	10
			Splitbeard bluestem	5
			Panicum	5
			Longleaf uniola	5
			Spreading panicum	5
			Waxmyrtle	5
			Greenbrier	5
			Florida paspalum	5
UPB*: Urland	Favorable	1,500	Pinehill bluestem	60
	Normal	1,350	Slender bluestem	5
	Unfavorable	950	Pineywoods dropseed	5
			Brownseed paspalum	5
			Yaupon	5
			American beautyberry	5
Pinetucky	Favorable	1,450	Pinehill bluestem	60
	Normal	1,200	Slender bluestem	5
	Unfavorable	900	Carolina jessamine	5
			Yaupon	5
			Greenbrier	5

See footnote at end of table.

TABLE 8.--WOODLAND UNDERSTORY VEGETATION--Continued

Soil name and map symbol	Total production		Characteristic vegetation	Composition
	Kind of year	Dry weight		
		Lb/acre		Pct
WAA*:				
Waller	Favorable	1,950	Pinehill bluestem	30
	Normal	1,650	Beaked panicum	10
	Unfavorable	1,250	Sedge	10
			Virginia wildrye	5
			Brownseed paspalum	5
			Carolina jessamine	5
			Greenbrier	5
			Southern bayberry	5
			Longleaf uniola	5
			Panicum	5
Evadale	Favorable	1,850	Pinehill bluestem	40
	Normal	1,500	Carolina jessamine	10
	Unfavorable	1,100	Longleaf uniola	5
			Spreading panicum	5
			Panicum	5
			Brownseed paspalum	5
			Sedge	5
			Splitbeard bluestem	5
			Greenbrier	5
			Waxmyrtle	5
WgC Wiergate	Favorable	1,950	Pinehill bluestem	50
	Normal	1,650	Slender bluestem	5
	Unfavorable	1,250	Sedge	5
			Longleaf uniola	5
			Pineywoods dropseed	5
			Brownseed paspalum	5
WTB*:				
Woodville	Favorable	1,950	Pinehill bluestem	50
	Normal	1,650	Slender bluestem	5
	Unfavorable	1,250	Sedge	5
			Longleaf uniola	5
			Pineywoods dropseed	5
			Brownseed paspalum	5
Redco	Favorable	2,000	Pinehill bluestem	50
	Normal	1,800	Slender bluestem	5
	Unfavorable	1,350	Splitbeard bluestem	5
			Sedge	5
			Switchgrass	5
			Longleaf uniola	5
			Pineywoods dropseed	5
			Brownseed paspalum	5
			Waxmyrtle	5

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
AtA Attoyac	Slight	Slight	Slight	Slight	Slight.
BaB*:					
Bernaldo	Slight	Slight	Slight	Slight	Slight.
Besner	Slight	Slight	Slight	Slight	Slight.
BeB*:					
Besner	Slight	Slight	Slight	Slight	Slight.
Mollville	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
BIB*:					
Bienville	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
Alaga	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
BOE*:					
Bonwier	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight	Moderate: slope.
Stringtown	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
BrD*:					
Browndell	Severe: percs slowly, depth to rock.	Severe: percs slowly, depth to rock.	Severe: slope, percs slowly, depth to rock.	Severe: erodes easily.	Severe: thin layer.
Rock outcrop.					
BuD Burkeville	Severe: percs slowly, too clayey, wetness.	Severe: wetness, too clayey, percs slowly.	Severe: too clayey, wetness, percs slowly.	Severe: wetness, too clayey.	Severe: wetness, too clayey.
CRB*:					
Corrigan	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, erodes easily.	Severe: wetness.
Rayburn	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Severe: erodes easily.	Slight.
De* Deweyville	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus.	Severe: ponding, flooding, excess humus.	Severe: ponding, excess humus.	Poor: wetness.
DUB*:					
Doucette	Slight	Slight	Moderate: slope.	Slight	Slight.
Boykin	Slight	Slight	Moderate: slope.	Slight	Slight.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
EaA------------------- Evadale	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, erodes easily.	Severe: wetness.
EdA------------------- Evadale	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding, erodes easily.	Severe: ponding.
EgB*:					
Evadale---------------	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, erodes easily.	Severe: wetness.
Gist------------------	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Slight------------	Slight.
EvA*:					
Evadale---------------	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, erodes easily.	Severe: wetness.
Vidrine---------------	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Severe: erodes easily.	Moderate: wetness.
GAB*:					
Gallime---------------	Slight----------	Slight----------	Moderate: slope.	Slight------------	Slight.
Spurger---------------	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: percs slowly, slope.	Severe: erodes easily.	Slight.
Gw*------------------- Gladewater	Severe: flooding, wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
Iu*------------------- Iuka	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: wetness, flooding.	Moderate: wetness, flooding.	Severe: flooding.
JaA------------------- Jasco	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding, erodes easily.	Severe: ponding.
KJB*:					
Kirbyville------------	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
Jasco-----------------	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding, erodes easily.	Severe: ponding.
KWB*:					
Kirbyville------------	Moderate: wetness.	Moderate: wetness.	Moderate: slope, wetness.	Moderate: wetness.	Moderate: wetness.
Waller----------------	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
KAE*:					
Kisatchie-------------	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Severe: erodes easily.	Moderate: slope, thin layer.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
KAE*:					
Rayburn	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Severe: erodes easily.	Moderate: slope.
LTC*:					
Letney	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
Tehran	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy, slope.	Moderate: too sandy.	Moderate: droughty.
MaB Malbis	Slight	Slight	Moderate: slope.	Slight	Slight.
MKB*:					
Malbis	Slight	Slight	Moderate: slope.	Slight	Slight.
Kirbyville	Moderate: wetness.	Moderate: wetness.	Moderate: slope, wetness.	Moderate: wetness.	Moderate: wetness.
Mn*:					
Mantachie	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: wetness, flooding.	Moderate: wetness, flooding.	Severe: flooding.
Bleakwood	Severe: flooding, wetness.	Severe: wetness.	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.
Mo* Melhomes	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, droughty, flooding.
Mr* Mooreville	Severe: flooding.	Moderate: wetness.	Moderate: wetness, flooding.	Moderate: wetness.	Moderate: wetness, flooding.
NEB*:					
Newco	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Severe: erodes easily.	Slight.
Urland	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Severe: erodes easily.	Slight.
NEE*:					
Newco	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
Urland	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
NfC Nikful	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, erodes easily.	Severe: wetness.
NKB*:					
Niwana	Slight	Slight	Slight	Slight	Slight.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
NKB*:					
Kirbyville	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
Oc* Ochlockonee	Severe: flooding.	Slight	Moderate: flooding.	Slight	Moderate: flooding.
PIC*:					
Pinetucky	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight	Slight.
Doucette	Slight	Slight	Moderate: slope.	Slight	Slight.
RAB*:					
Rayburn	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Severe: erodes easily.	Slight.
Corrigan	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, erodes easily.	Severe: wetness.
RBE*:					
Rayburn	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Severe: erodes easily.	Moderate: slope.
Kisatchie	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Severe: erodes easily.	Moderate: slope, thin layer.
REB*:					
Redco	Severe: too clayey, wetness, percs slowly.	Severe: too clayey, wetness.	Severe: slope, too clayey, wetness.	Severe: wetness, too clayey.	Severe: too clayey, wetness.
Woodville	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Severe: erodes easily.	Slight.
RPB*:					
Rogan	Moderate: small stones, percs slowly.	Moderate: small stones, percs slowly.	Severe: small stones.	Slight	Moderate: small stones.
Pinetucky	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight	Slight.
SBC*:					
Shankler	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
Boykin	Slight	Slight	Moderate: slope.	Slight	Slight.
SBE*:					
Shankler	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope, droughty.
Boykin	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
SMB*:					
Spurger	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: percs slowly.	Severe: erodes easily.	Slight.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
SMB*:					
Mollville	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
STE*:					
Stringtown	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Bonwier	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight	Moderate: slope.
SXC*:					
Stringtown	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Bonwier	Severe: slope, too clayey.	Severe: slope, too clayey.	Severe: slope, too clayey.	Severe: too clayey.	Severe: slope, too clayey.
TaB Tahoula	Severe: percs slowly, too clayey, wetness.	Severe: wetness, too clayey, percs slowly.	Severe: too clayey, wetness, percs slowly.	Severe: wetness, too clayey.	Severe: wetness, too clayey.
TaD Tahoula	Severe: percs slowly, too clayey, wetness.	Severe: wetness, too clayey, percs slowly.	Severe: too clayey, wetness, slope.	Severe: wetness, too clayey.	Severe: wetness, too clayey.
TLE*:					
Tehran	Moderate: slope, too sandy.	Moderate: too sandy, slope.	Severe: slope.	Moderate: too sandy.	Moderate: droughty, slope.
Letney	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: droughty, slope.
Um*:					
Urbo	Severe: flooding, wetness, percs slowly.	Severe: too clayey, percs slowly.	Severe: wetness, flooding.	Severe: too clayey.	Severe: flooding, too clayey.
Mantachie	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: wetness, flooding.	Moderate: wetness, flooding.	Severe: flooding.
UPB*:					
Urland	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Severe: erodes easily.	Slight.
Pinetucky	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight	Slight.
WAA*:					
Waller	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Evadale	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, erodes easily.	Severe: wetness.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
WgC------------------- Wiergate	Severe: percs slowly, too clayey, wetness.	Severe: wetness, too clayey, percs slowly.	Severe: too clayey, wetness.	Severe: wetness, too clayey.	Severe: wetness, too clayey.
WTB*:					
Woodville------------	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Severe: erodes easily.	Slight.
Redco----------------	Severe: too clayey, wetness, percs slowly.	Severe: too clayey, wetness.	Severe: slope, too clayey, wetness.	Severe: wetness, too clayey.	Severe: too clayey, wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--WILDLIFE HABITAT

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
AtA Attoyac	Good	Good	Good	---	Good	Poor	Very poor.	Good	Good	Very poor.
BaB*:										
Bernaldo	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Besner	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
BeB*:										
Besner	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Mollville	Poor	Fair	Fair	Fair	Poor	Good	Good	Fair	Fair	Good
BIB*:										
Bienville	Fair	Fair	Fair	---	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Alaga	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
BOE*:										
Bonwier	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Stringtown	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
BrD*:										
Browndell	Poor	Poor	Fair	Fair	Fair	Poor	Poor	Poor	Fair	Poor
Rock outcrop.										
BuD Burkeville	Fair	Fair	Fair	Fair	Poor	Poor	Very poor.	Fair	Fair	Very poor.
CRB*:										
Corrigan	Fair	Fair	Good	Good	Good	Fair	Very poor.	Fair	Good	Very poor.
Rayburn	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
De* Deweyville	Very poor.	Poor	Poor	Poor	---	Good	Good	Poor	Poor	Good
DUB*:										
Doucette	Poor	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
Boykin	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
EaA, EdA Evadale	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good
EgB*:										
Evadale	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good
Gist	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
EvA*:										
Evadale	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good
Vidrine	Fair	Good	Good	---	Good	Fair	Fair	Good	Good	Fair
GAB*:										
Gallime	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Spurger	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
Gw* Gladewater	Poor	Fair	Fair	Fair	---	Poor	Good	Fair	Fair	Fair
Iu* Iuka	Poor	Fair	Fair	Good	Good	Poor	Poor	Fair	Good	Poor
JaA Jasco	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good
KJB*:										
Kirbyville	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
Jasco	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good
KWB*:										
Kirbyville	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
Waller	Poor	Fair	Fair	Good	Fair	Good	Good	Fair	Good	Good
KAE*:										
Kisatchie	Poor	Fair	Fair	---	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Rayburn	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
LTC*:										
Letney	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Tehran	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
MaB Malbis	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
MKB*:										
Malbis	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
Kirbyville	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
Mn*:										
Mantachie	Poor	Fair	Fair	Good	---	Fair	Fair	Fair	Good	Fair
Bleakwood	Poor	Fair	Fair	Good	---	Good	Fair	Fair	Good	Fair
Mo* Melhomes	Very poor.	Poor	Fair	Fair	Fair	Fair	Good	Poor	Fair	Fair
Mr* Mooreville	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
NEB*:										
Newco	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Poor
Urland	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
NEE*:										
Newco	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Urland	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
NfC Nikful	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor
NKB*:										
Niwana	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Kirbyville	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
Oc* Ochlockonee	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
PIC*:										
Pinetucky	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Doucette	Poor	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
RAB*:										
Rayburn	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Corrigan	Fair	Fair	Good	Good	Good	Fair	Very poor.	Fair	Good	Very poor.
RBE*:										
Rayburn	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Kisatchie	Poor	Fair	Fair	---	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
REB*:										
Redco	Poor	Fair	Fair	Fair	Fair	Poor	Fair	Fair	Fair	Poor
Woodville	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
RPB*:										
Rogan	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Pinetucky	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
SBC*, SBE*:										
Shankler	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Boykin	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
SMB*:										
Spurger	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
Mollville	Poor	Fair	Fair	Fair	Poor	Good	Good	Fair	Fair	Good
STE*:										
Stringtown	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Bonwier	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
SXC*:										
Stringtown	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Bonwier	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
TaB Tahoula	Fair	Fair	Fair	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
TaD Tahoula	Fair	Fair	Fair	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
TLE*:										
Tehran	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Letney	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Um*:										
Urbo	Poor	Fair	Fair	Good	---	Fair	Fair	Fair	Fair	Fair
Mantachie	Poor	Fair	Fair	Good	---	Fair	Fair	Fair	Good	Fair
UPB*:										
Urland	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Pinetucky	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
WAA*:										
Waller	Poor	Fair	Fair	Good	Fair	Good	Good	Fair	Good	Good
Evadale	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good
WgC Wiergate	Fair	Fair	Fair	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
WTB*:										
Woodville	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Redco	Poor	Fair	Fair	Fair	Fair	Poor	Fair	Fair	Fair	Poor

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
AtA Attoyac	Slight	Slight	Slight	Slight	Moderate: low strength.	Slight.
BaB*: Bernaldo	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
Besner	Moderate: wetness.	Slight	Moderate: wetness.	Slight	Slight	Slight.
BeB*: Besner	Moderate: wetness.	Slight	Moderate: wetness.	Slight	Slight	Slight.
Mollville	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
BIB*: Bienville	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Moderate: droughty.
Alaga	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.
BOE*: Bonwier	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
Stringtown	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.
BrD*: Browndell	Severe: depth to rock.	Severe: shrink-swell.	Severe: shrink-swell, depth to rock.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Severe: thin layer.
Rock outcrop.						
BuD Burkeville	Severe: too clayey, wetness, cutbanks cave.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength.	Severe: wetness, too clayey.
CRB*: Corrigan	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, wetness.	Severe: wetness.
Rayburn	Moderate: too clayey, wetness.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Slight.
De* Deweyville	Severe: excess humus, ponding.	Severe: flooding, ponding, low strength.	Severe: flooding, ponding, low strength.	Severe: flooding, ponding, low strength.	Severe: ponding, flooding.	Poor: wetness.
DUB*: Doucette	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Moderate: low strength.	Slight.
Boykin	Slight	Slight	Slight	Moderate: slope.	Moderate: low strength.	Slight.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
EaA Evadale	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Severe: wetness.
EdA Evadale	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding.	Severe: ponding.
EgB*:						
Evadale	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Severe: wetness.
Gist	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Slight.
EvA*:						
Evadale	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Severe: wetness.
Vidrine	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, shrink-swell.	Moderate: wetness.
GAB*:						
Gallime	Moderate: wetness.	Slight	Moderate: wetness, shrink-swell.	Slight	Slight	Slight.
Spurger	Moderate: too clayey, wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
Gw* Gladewater	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.
Iu* Iuka	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.
JaA Jasco	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
KJB*:						
Kirbyville	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: low strength.	Moderate: wetness.
Jasco	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
KWB*:						
Kirbyville	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: low strength.	Moderate: wetness.
Waller	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
KAE*:						
Kisatchie	Moderate: depth to rock, too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.	Moderate: slope, thin layer.
Rayburn	Moderate: too clayey, wetness, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.	Moderate: slope.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
LTC*:						
Letney	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
Tehran	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
MaB Malbis	Moderate: wetness.	Slight	Moderate: wetness.	Slight	Moderate: low strength.	Slight.
MKB*:						
Malbis	Moderate: wetness.	Slight	Moderate: wetness.	Slight	Moderate: low strength.	Slight.
Kirbyville	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: low strength.	Moderate: wetness.
Mn*:						
Mantachie	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.
Bleakwood	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.
Mo* Melhomes	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, droughty, flooding.
Mr* Mooreville	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength, flooding.	Moderate: wetness, flooding.
NEB*:						
Newco	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Slight.
Urland	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Slight.
NEE*:						
Newco	Moderate: too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.	Moderate: slope.
Urland	Moderate: too clayey, slope.	Moderate: slope, shrink-swell.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: slope, shrink-swell.	Moderate: slope.
NfC Nikful	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, wetness, shrink-swell.	Severe: wetness.
NKB*:						
Niwana	Moderate: wetness.	Slight	Moderate: wetness.	Slight	Slight	Slight.
Kirbyville	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: low strength.	Moderate: wetness.
Oc* Ochlockonee	Moderate: wetness.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
PIC*:						
Pinetucky	Slight	Slight	Slight	Moderate: slope.	Severe: low strength.	Slight.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
PIC*: Doucette	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Moderate: low strength.	Slight.
RAB*: Rayburn	Moderate: too clayey, wetness.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Slight.
Corrigan	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, wetness.	Severe: wetness.
RBE*: Rayburn	Moderate: too clayey, wetness, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.	Moderate: slope.
Kisatchie	Moderate: depth to rock, too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.	Moderate: slope, thin layer.
REB*: Redco	Severe: too clayey, wetness, cutbanks cave.	Severe: shrink-swell, wetness.	Severe: wetness, shrink-swell.	Severe: shrink-swell, wetness.	Severe: low strength, shrink-swell, wetness.	Severe: too clayey, wetness.
Woodville	Moderate: too clayey, wetness.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Slight.
RPB*: Rogan	Slight	Slight	Slight	Slight	Severe: low strength.	Moderate: small stones.
Pinetucky	Slight	Slight	Slight	Slight	Severe: low strength.	Slight.
SBC*: Shankler	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
Boykin	Slight	Slight	Slight	Moderate: slope.	Moderate: low strength.	Slight.
SBE*: Shankler	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope, droughty.
Boykin	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
SMB*: Spurger	Moderate: too clayey, wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
Mollville	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
STE*: Stringtown	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
STE*: Bonwier	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
SXC*: Stringtown.						
Bonwier.						
TaB Tahoula	Severe: wetness, cutbanks cave.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength, wetness.	Severe: wetness, too clayey.
TaD Tahoula	Severe: wetness, cutbanks cave.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell, slope.	Severe: shrink-swell, low strength, wetness.	Severe: wetness, too clayey.
TLE*: Tehran	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
Letney	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
Um*: Urbo	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, flooding.	Severe: flooding, too clayey.
Mantachie	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.
UPB*: Urland	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: slope, shrink-swell.	Moderate: shrink-swell.	Slight.
Pinetucky	Slight	Slight	Slight	Moderate: slope.	Severe: low strength.	Slight.
WAA*: Waller	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Evadale	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Severe: wetness.
WgC Wiergate	Severe: wetness, cutbanks cave.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength, wetness.	Severe: wetness, too clayey.
WTB*: Woodville	Moderate: too clayey, wetness.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Slight.
Redco	Severe: too clayey, wetness, cutbanks cave.	Severe: shrink-swell, wetness.	Severe: wetness, shrink-swell.	Severe: shrink-swell, wetness.	Severe: low strength, shrink-swell, wetness.	Severe: too clayey, wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
AtA Attoyac	Slight	Moderate: seepage.	Slight	Slight	Good.
BaB*:					
Bernaldo	Moderate: wetness.	Moderate: seepage.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
Besner	Moderate: wetness.	Severe: seepage.	Severe: wetness.	Severe: seepage.	Good.
BeB*:					
Besner	Moderate: wetness.	Severe: seepage.	Severe: wetness.	Severe: seepage.	Good.
Mollville	Severe: flooding, wetness, percs slowly.	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
BIB*:					
Bienville	Moderate: wetness.	Severe: seepage.	Severe: seepage, wetness.	Severe: seepage.	Fair: too sandy.
Alaga	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
BOE*:					
Bonwier	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
Stringtown	Moderate: slope.	Severe: slope.	Moderate: too clayey, slope.	Moderate: slope.	Fair: too clayey, slope, small stones.
BrD*:					
Browndell	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, hard to pack.
Rock outcrop.					
BuD Burkeville	Severe: percs slowly, wetness.	Severe: slope.	Severe: too clayey, wetness.	Severe: wetness.	Poor: too clayey, wetness.
CRB*:					
Corrigan	Severe: depth to rock, wetness, percs slowly.	Severe: depth to rock, wetness.	Severe: depth to rock, wetness.	Severe: depth to rock, wetness.	Poor: area reclaim, too clayey, hard to pack.
Rayburn	Severe: wetness, percs slowly.	Severe: wetness.	Severe: depth to rock, too clayey.	Moderate: wetness, depth to rock.	Poor: too clayey, hard to pack.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
De* Deweyville	Severe: flooding, ponding.	Severe: seepage, flooding, excess humus.	Severe: flooding, seepage, ponding.	Severe: flooding, seepage, ponding.	Poor: ponding, excess humus.
DUB*: Doucette	Slight	Moderate: seepage, slope.	Slight	Slight	Good.
Boykin	Slight	Moderate: seepage, slope.	Slight	Slight	Good.
EaA Evadale	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
EdA Evadale	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
EgB*: Evadale	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Gist	Severe: percs slowly, wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Fair: wetness.
EvA*: Evadale	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Vidrine	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
GAB*: Gallime	Moderate: wetness.	Severe: seepage.	Severe: wetness.	Severe: seepage.	Good.
Spurger	Severe: percs slowly, wetness.	Severe: wetness.	Severe: too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.
Gw* Gladewater	Severe: flooding, wetness, percs slowly.	Slight	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
Iu* Iuka	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: wetness.
JaA Jasco	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
KJB*:					
Kirbyville	Severe: wetness.	Severe: wetness, seepage.	Severe: wetness, seepage.	Severe: wetness, seepage.	Fair: wetness.
Jasco	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
KWB*:					
Kirbyville	Severe: wetness.	Severe: wetness, seepage.	Severe: wetness, seepage.	Severe: wetness, seepage.	Fair: wetness.
Waller	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
KAE*:					
Kisatchie	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, hard to pack.
Rayburn	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: depth to rock, too clayey.	Moderate: depth to rock, wetness, slope.	Poor: too clayey, hard to pack.
LTC*:					
Letney	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Good.
Tehran	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: too sandy.
MaB Malbis	Severe: wetness, percs slowly.	Moderate: slope.	Moderate: wetness.	Moderate: wetness.	Fair: wetness.
MKB*:					
Malbis	Severe: wetness, percs slowly.	Moderate: slope.	Moderate: wetness.	Moderate: wetness.	Fair: wetness.
Kirbyville	Severe: wetness.	Severe: wetness, seepage.	Severe: wetness, seepage.	Severe: wetness, seepage.	Fair: wetness.
Mn*:					
Mantachie	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
Bleakwood	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
Mo* Melhomes	Severe: flooding, wetness, poor filter.	Severe: seepage, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness, seepage.	Poor: seepage, too sandy, wetness.
Mr* Mooreville	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: too clayey, wetness.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
NEB*:					
Newco	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
Urland	Severe: percs slowly.	Moderate: slope, seepage.	Slight	-------------------	Fair: too clayey.
NEE*:					
Newco	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
Urland	Severe: percs slowly, slope.	Severe: slope.	Slight	Moderate: slope.	Fair: too clayey.
NfC Nikful	Severe: wetness, percs slowly.	Severe: wetness.	Severe: depth to rock, too clayey, wetness.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
NKB*:					
Niwana	Moderate: wetness, percs slowly.	Moderate: wetness, seepage.	Severe: wetness.	Severe: seepage.	Good.
Kirbyville	Severe: wetness.	Severe: wetness, seepage.	Severe: wetness, seepage.	Severe: wetness, seepage.	Fair: wetness.
Oc* Ochlockonee	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Fair: wetness.
PIC*:					
Pinetucky	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight	Fair: too clayey.
Doucette	Slight	Moderate: seepage, slope.	Slight	Slight	Good.
RAB*:					
Rayburn	Severe: wetness, percs slowly.	Severe: wetness.	Severe: depth to rock, too clayey.	Moderate: wetness, depth to rock.	Poor: too clayey, hard to pack.
Corrigan	Severe: depth to rock, wetness, percs slowly.	Severe: depth to rock, wetness.	Severe: depth to rock, wetness.	Severe: depth to rock, wetness.	Poor: area reclaim, too clayey, hard to pack.
RBE*:					
Rayburn	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: depth to rock, too clayey.	Moderate: depth to rock, wetness, slope.	Poor: too clayey, hard to pack.
Kisatchie	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, hard to pack.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
REB*:					
Redco	Severe: percs slowly, wetness.	Moderate: slope.	Severe: too clayey, wetness.	Severe: wetness.	Poor: too clayey.
Woodville	Severe: percs slowly, wetness.	Moderate: slope.	Severe: too clayey, wetness.	Severe: wetness.	Poor: too clayey, hard to pack.
RPB*:					
Rogan	Severe: percs slowly.	Moderate: seepage.	Moderate: too clayey.	Slight	Fair: too clayey, small stones.
Pinetucky	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight	Fair: too clayey.
SBC*:					
Shankler	Slight	Severe: seepage.	Moderate: too sandy.	Severe: seepage.	Fair: too sandy.
Boykin	Slight	Moderate: seepage, slope.	Slight	Slight	Good.
SBE*:					
Shankler	Moderate: slope.	Severe: seepage, slope.	Moderate: too sandy, slope.	Severe: seepage.	Fair: too sandy, slope.
Boykin	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
SMB*:					
Spurger	Severe: percs slowly, wetness.	Severe: wetness.	Severe: too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.
Mollville	Severe: flooding, wetness, percs slowly.	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
STE*:					
Stringtown	Moderate: slope.	Severe: slope.	Moderate: too clayey, slope.	Moderate: slope.	Fair: too clayey, slope, small stones.
Bonwier	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
SXC*:					
Stringtown.					
Bonwier.					
TaB Tahoula	Severe: percs slowly, wetness.	Moderate: slope.	Severe: too clayey, wetness.	Severe: wetness.	Poor: too clayey, wetness, hard to pack.
TaD Tahoula	Severe: percs slowly, wetness.	Severe: slope.	Severe: too clayey, wetness.	Severe: wetness.	Poor: too clayey, wetness, hard to pack.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
TLE*:					
Tehran	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: too sandy, slope.
Letney	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: slope.
Um*:					
Urbo	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
Mantachie	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
UPB*:					
Urland	Severe: percs slowly.	Moderate: slope, seepage.	Slight		Fair: too clayey.
Pinetucky	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight	Fair: too clayey.
WAA*:					
Waller	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Evadale	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
WgC Wiergate	Severe: percs slowly, wetness.	Moderate: slope.	Severe: too clayey, wetness.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
WTB*:					
Woodville	Severe: percs slowly, wetness.	Moderate: slope.	Severe: too clayey, wetness.	Severe: wetness.	Poor: too clayey, hard to pack.
Redco	Severe: percs slowly, wetness.	Moderate: slope.	Severe: too clayey, wetness.	Severe: wetness.	Poor: too clayey.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," "poor," "probable," and "improbable." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
AtA Attoyac	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
BaB*: Bernaldo	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Besner	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
BeB*: Besner	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
Mollville	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
BIB*: Bienville	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
Alaga	Good	Probable	Improbable: too sandy.	Fair: too sandy.
BOE*: Bonwier	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Stringtown	Fair: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
BrD*: Browndell	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, too clayey.
Rock outcrop.				
BuD Burkeville	Poor: low strength, wetness, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey, wetness.
CRB*: Corrigan	Poor: area reclaim, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
Rayburn	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
De* Deweyville	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
DUB*: Doucette	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
DUB*:				
Boykin	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
EaA Evadale	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
EdA Evadale	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, too clayey.
EgB*:				
Evadale	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
Gist	Fair: thin layer, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
EvA*:				
Evadale	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
Vidrine	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
GAB*:				
Gallime	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Good.
Spurger	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Gw* Gladewater	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
Iu* Iuka	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
JaA Jasco	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
KJB*:				
Kirbyville	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Jasco	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
KWB*:				
Kirbyville	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Waller	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
KAE*:				
Kisatchie	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
KAE*:				
Rayburn	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
LTC*:				
Letney	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
Tehran	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
MaB Malbis	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
MKB*:				
Malbis	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
Kirbyville	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Mn*:				
Mantachie	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
Bleakwood	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Mo* Melhomes	Poor: wetness.	Probable	Improbable: too sandy.	Poor: wetness.
Mr* Mooreville	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
NEB*, NEE*:				
Newco	Severe: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Urland	Moderate: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
NfC Nikful	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
NKB*:				
Niwana	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
Kirbyville	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Oc* Ochlockonee	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
PIC*:				
Pinetucky	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Doucette	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
RAB*:				
Rayburn	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Corrigan	Poor: area reclaim, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
RBE*:				
Rayburn	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Kisatchie	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
REB*:				
Redco	Poor: low strength, shrink-swell, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Woodville	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
RPB*:				
Rogan	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Pinetucky	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
SBC*:				
Shankler	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
Boykin	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
SBE*:				
Shankler	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, slope.
Boykin	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, slope.
SMB*:				
Spurger	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Mollville	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
STE*:				
Stringtown	Fair: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
Bonwier	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
SXC*:				
Stringtown	Fair: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
Bonwier	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
TaB, TaD Tahoula	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
TLE*:				
Tehran	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, slope.
Letney	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, slope.
Um*:				
Urbo	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Mantachie	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
UPB*:				
Urland	Moderate: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Pinetucky	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
WAA*:				
Waller	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Evadale	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
WgC Wiergate	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
WTB*:				
Woodville	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Redco	Poor: low strength, shrink-swell, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated]

Soil name and map symbol	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
AtA Attoyac	Moderate: seepage.	Moderate: piping.	Severe: no water.	Deep to water	Favorable	Favorable	Favorable.
BaB*:							
Bernaldo	Moderate: seepage.	Moderate: piping.	Moderate: deep to water, slow refill.	Deep to water	Favorable	Favorable	Favorable.
Besner	Severe: seepage.	Severe: piping.	Moderate: deep to water, slow refill.	Deep to water	Favorable	Favorable	Favorable.
BeB*:							
Besner	Severe: seepage.	Severe: piping.	Moderate: deep to water, slow refill.	Deep to water	Favorable	Favorable	Favorable.
Mollville	Moderate: seepage.	Severe: piping, wetness.	Severe: no water.	Percs slowly, flooding.	Wetness, percs slowly, flooding.	Wetness, percs slowly.	Wetness, percs slowly.
BIB*:							
Bienville	Severe: seepage.	Severe: piping.	Severe: cutbanks cave.	Deep to water	Droughty, fast intake.	Favorable	Droughty.
Alaga	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, slope.	Too sandy	Droughty.
BOE*:							
Bonwier	Slight	Severe: hard to pack.	Severe: no water.	Deep to water	Slope	Slope	Slope.
Stringtown	Severe: slope.	Moderate: thin layer, piping.	Severe: no water.	Deep to water	Slope	Slope	Slope.
BrD*:							
Browndell	Severe: depth to rock.	Severe: hard to pack, thin layer.	Severe: no water.	Deep to water	Percs slowly, depth to rock, slope.	Depth to rock, erodes easily.	Erodes easily, depth to rock.
Rock outcrop.							
BuD Burkeville	Slight	Moderate: hard to pack.	Severe: no water.	Percs slowly	Slow intake, percs slowly, wetness.	Percs slowly, wetness.	Percs slowly, wetness.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
CRB*:							
Corrigan	Moderate: depth to rock, slope.	Severe: hard to pack, wetness.	Severe: no water.	Percs slowly, depth to rock, slope.	Wetness, percs slowly, depth to rock.	Depth to rock, erodes easily.	Wetness, erodes easily.
Rayburn	Moderate: depth to rock, slope.	Severe: hard to pack.	Severe: no water.	Percs slowly, slope.	Wetness, percs slowly.	Erodes easily, wetness.	Erodes easily, percs slowly.
De* Deweyville	Severe: seepage.	Severe: excess humus, ponding.	Slight	Ponding, flooding, subsides.	Flooding, ponding.	Ponding	Wetness.
DUB*:							
Doucette	Moderate: seepage.	Severe: piping.	Severe: no water.	Deep to water	Fast intake, slope.	Favorable	Favorable.
Boykin	Moderate: seepage.	Moderate: piping.	Severe: no water.	Deep to water	Fast intake, slope.	Favorable	Favorable.
EaA Evadale	Slight	Severe: wetness.	Severe: no water.	Percs slowly	Wetness, percs slowly, erodes easily.	Wetness, percs slowly, erodes easily.	Wetness, percs slowly, erodes easily.
EdA Evadale	Slight	Severe: ponding.	Severe: no water.	Percs slowly	Ponding, percs slowly, erodes easily.	Ponding, percs slowly, erodes easily.	Wetness, percs slowly, erodes easily.
EgB*:							
Evadale	Slight	Severe: wetness.	Severe: no water.	Percs slowly	Wetness, percs slowly, erodes easily.	Wetness, percs slowly, erodes easily.	Wetness, percs slowly, erodes easily.
Gist	Moderate: seepage.	Severe: piping.	Severe: no water.	Favorable	Percs slowly, wetness, erodes easily.	Erodes easily	Erodes easily.
EvA*:							
Evadale	Slight	Severe: wetness.	Severe: no water.	Percs slowly	Wetness, percs slowly, erodes easily.	Wetness, percs slowly, erodes easily.	Wetness, percs slowly, erodes easily.
Vidrine	Slight	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
GAB*:							
Gallime	Severe: seepage.	Moderate: piping.	Moderate: deep to water, slow refill.	Deep to water	Favorable	Favorable	Favorable.
Spurger	Slight	Moderate: hard to pack.	Severe: no water.	Percs slowly	Percs slowly, erodes easily, wetness.	Percs slowly, erodes easily, wetness.	Percs slowly, erodes easily.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Gw*---------------- Gladewater	Slight----------	Severe: hard to pack, wetness.	Severe: slow refill.	Percs slowly, flooding.	Wetness, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
Iu*---------------- Iuka	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Flooding--------	Wetness, flooding.	Wetness---------	Wetness.
JaA---------------- Jasco	Slight----------	Severe: piping, ponding.	Severe: no water.	Percs slowly, ponding.	Ponding, droughty, percs slowly.	Erodes easily, ponding, rooting depth.	Wetness, erodes easily, droughty.
KJB*:							
Kirbyville--------	Moderate: seepage.	Severe: wetness.	Moderate: deep to water, slow refill.	Favorable-------	Wetness---------	Wetness---------	Good.
Jasco------------	Slight----------	Severe: piping, ponding.	Severe: no water.	Percs slowly, ponding.	Ponding, droughty, percs slowly.	Erodes easily, ponding, rooting depth.	Wetness, erodes easily, droughty.
KWB*:							
Kirbyville--------	Moderate: seepage.	Severe: wetness.	Moderate: deep to water, slow refill.	Favorable-------	Wetness---------	Wetness---------	Good.
Waller------------	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Favorable-------	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
KAE*:							
Kisatchie---------	Moderate: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Percs slowly, depth to rock, slope.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
Rayburn-----------	Severe: slope.	Severe: hard to pack.	Severe: no water.	Percs slowly, slope.	Wetness, percs slowly.	Slope, erodes easily, wetness.	Slope, erodes easily, percs slowly.
LTC*:							
Letney------------	Severe: seepage.	Slight----------	Severe: no water.	Deep to water	Droughty, fast intake, slope.	Favorable-------	Droughty.
Tehran------------	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, slope.	Too sandy-------	Droughty.
MaB---------------- Malbis	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope-----------	Favorable-------	Favorable.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
MKB*:							
Malbis	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Favorable	Favorable.
Kirbyville	Moderate: seepage.	Severe: wetness.	Moderate: deep to water, slow refill.	Favorable	Wetness	Wetness	Good.
Mn*:							
Mantachie	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Flooding	Wetness, flooding.	Wetness	Wetness.
Bleakwood	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Flooding	Flooding, wetness.	Wetness	Wetness.
Mo* Melhomes	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy.	Wetness, droughty.
Mr* Mooreville	Moderate: seepage.	Severe: wetness.	Moderate: slow refill.	Flooding	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Erodes easily.
NEB*:							
Newco	Moderate: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Percs slowly, slope, erodes easily.	Erodes easily, percs slowly.	Percs slowly, erodes easily.
Urland	Moderate: seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
NEE*:							
Newco	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Percs slowly, slope, erodes easily.	Erodes easily, slope, percs slowly.	Percs slowly, slope, erodes easily.
Urland	Moderate: seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
NfC Nikful	Moderate: depth to rock, slope.	Severe: hard to pack, wetness.	Severe: no water.	Percs slowly, slope.	Wetness, percs slowly, slope.	Erodes easily, wetness, percs slowly.	Percs slowly, wetness, erodes easily.
NKB*:							
Niwana	Moderate: seepage.	Moderate: piping.	Moderate: deep to water, slow refill.	Deep to water	Favorable	Favorable	Favorable.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
NKB*:							
Kirbyville	Moderate: seepage.	Severe: wetness.	Moderate: deep to water, slow refill.	Favorable	Wetness	Wetness	Good.
Oc* Ochlockonee	Severe: seepage.	Severe: piping.	Severe: cutbanks cave.	Deep to water	Flooding	Favorable	Favorable.
PIC*:							
Pinetucky	Moderate: slope.	Moderate: piping.	Severe: no water.	Deep to water	Slope	Favorable	Favorable.
Doucette	Moderate: seepage.	Severe: piping.	Severe: no water.	Deep to water	Fast intake, slope.	Favorable	Favorable.
RAB*:							
Rayburn	Moderate: depth to rock, slope.	Severe: hard to pack.	Severe: no water.	Percs slowly, slope.	Wetness, percs slowly.	Erodes easily, wetness.	Erodes easily, percs slowly.
Corrigan	Moderate: depth to rock, slope.	Severe: hard to pack, wetness.	Severe: no water.	Percs slowly, depth to rock, slope.	Wetness, percs slowly, depth to rock.	Depth to rock, erodes easily.	Wetness, erodes easily.
RBE*:							
Rayburn	Severe: slope.	Severe: hard to pack.	Severe: no water.	Percs slowly, slope.	Wetness, percs slowly.	Slope, erodes easily, wetness.	Slope, erodes easily, percs slowly.
Kisatchie	Moderate: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Percs slowly, depth to rock, slope.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
REB*:							
Redco	Moderate: slope.	Severe: hard to pack.	Severe: slow refill.	Percs slowly	Slow intake, percs slowly, wetness.	Wetness, percs slowly.	Wetness, percs slowly.
Woodville	Slight	Severe: hard to pack.	Severe: slow refill.	Percs slowly, slope.	Wetness, percs slowly, slope.	Erodes easily, percs slowly, wetness.	Erodes easily, percs slowly.
RPB*:							
Rogan	Moderate: slope.	Moderate: piping.	Severe: no water.	Deep to water	Slope	Favorable	Favorable.
Pinetucky	Moderate: slope.	Moderate: piping.	Severe: no water.	Deep to water	Slope	Favorable	Favorable.
SBC*:							
Shankler	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, slope.	Too sandy	Droughty.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
SBC*: Boykin	Moderate: seepage.	Moderate: piping.	Severe: no water.	Deep to water	Fast intake, slope.	Favorable	Favorable.
SBE*: Shankler	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, slope.	Slope, too sandy.	Slope, droughty.
Boykin	Severe: slope.	Moderate: piping.	Severe: no water.	Deep to water	Fast intake, slope.	Slope	Slope.
SMB*: Spurger	Slight	Moderate: hard to pack.	Severe: no water.	Percs slowly	Percs slowly, erodes easily, wetness.	Percs slowly, erodes easily, wetness.	Percs slowly, erodes easily.
Mollville	Moderate: seepage.	Severe: piping, wetness.	Severe: no water.	Percs slowly, flooding.	Wetness, percs slowly, flooding.	Wetness, percs slowly.	Wetness, percs slowly.
STE*: Stringtown	Severe: slope.	Moderate: thin layer, piping.	Severe: no water.	Deep to water	Slope	Slope	Slope.
Bonwier	Slight	Severe: hard to pack.	Severe: no water.	Deep to water	Slope	Slope	Slope.
SXC*: Stringtown	Slight	Moderate: thin layer, piping.	Severe: no water.	Deep to water	Slope	Favorable	Favorable.
Bonwier	Slight	Moderate: hard to pack.	Severe: no water.	Deep to water	Slow intake, slope.	Favorable	Favorable.
TaB Tahoula	Moderate: slope.	Severe: hard to pack, wetness.	Severe: no water.	Percs slowly, slope.	Slow intake, percs slowly, wetness.	Percs slowly, wetness.	Percs slowly, wetness.
TaD Tahoula	Severe: slope.	Severe: hard to pack, wetness.	Severe: no water.	Percs slowly, slope.	Slow intake, percs slowly, wetness.	Percs slowly, wetness, slope.	Percs slowly, wetness, slope.
TLE*: Tehran	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, slope.	Slope, too sandy.	Slope, droughty.
Letney	Severe: seepage.	Slight	Severe: no water.	Deep to water	Droughty, fast intake, slope.	Slope	Slope, droughty.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Um*:							
Urbo	Slight	Severe: wetness.	Severe: slow refill.	Percs slowly, flooding.	Slow intake, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
Mantachie	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Flooding	Wetness, flooding.	Wetness	Wetness.
UPB*:							
Urland	Moderate: seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
Pinetucky	Moderate: slope.	Moderate: piping.	Severe: no water.	Deep to water	Slope	Favorable	Favorable.
WAA*:							
Waller	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Favorable	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
Evadale	Slight	Severe: wetness.	Severe: no water.	Percs slowly	Wetness, percs slowly, erodes easily.	Wetness, percs slowly, erodes easily.	Wetness, percs slowly, erodes easily.
WgC Wiergate	Moderate: slope.	Severe: hard to pack, wetness.	Severe: no water.	Percs slowly, slope.	Slow intake, percs slowly, wetness.	Percs slowly, wetness.	Percs slowly, wetness.
WTB*:							
Woodville	Slight	Severe: hard to pack.	Severe: slow refill.	Percs slowly, slope.	Wetness, percs slowly, slope.	Erodes easily, percs slowly, wetness.	Erodes easily, percs slowly.
Redco	Slight	Severe: hard to pack.	Severe: slow refill.	Percs slowly	Slow intake, percs slowly, wetness.	Wetness, percs slowly.	Wetness, percs slowly.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
AtA Attoyac	0-11	Fine sandy loam	SM-SC, CL-ML, ML, SM	A-4	0	98-100	95-100	70-100	40-65	<23	NP-7
	11-72	Sandy clay loam, loam, fine sandy loam.	CL, SC	A-4, A-6	0	98-100	95-100	80-100	45-75	23-40	7-22
BaB*: Bernaldo	0-8	Loam	ML, SM, CL-ML, SM-SC	A-4	0	100	95-100	90-100	45-75	<25	NP-5
	8-43	Loam, sandy clay loam, clay loam.	CL	A-6	0	100	100	90-100	51-75	28-40	12-22
	43-75	Fine sandy loam, loam, sandy clay loam.	CL, SC	A-4, A-6	0	100	95-100	90-100	45-65	25-40	8-22
Besner	0-22	Fine sandy loam	SM, ML, CL-ML, SM-SC	A-4	0	100	95-100	90-100	38-70	<25	NP-7
	22-37	Loam, fine sandy loam.	CL-ML, ML, SM-SC, SM	A-4	0	100	95-100	80-100	40-75	<25	NP-7
	37-70	Loam, sandy clay loam.	SC, CL	A-6, A-4	0	100	95-100	80-100	35-75	18-35	8-20
BeB*: Besner	0-22	Fine sandy loam	SM, ML, CL-ML, SM-SC	A-4	0	100	95-100	90-100	45-70	<25	NP-7
	22-28	Loam, fine sandy loam.	CL-ML, ML, SM-SC, SM	A-4	0	100	95-100	80-100	40-75	<25	NP-7
	28-65	Loam, sandy clay loam.	SC, CL	A-6, A-4	0	100	95-100	80-100	35-75	18-35	8-20
Mollville	0-12	Silt loam	ML, CL-ML, CL	A-4, A-6	0	100	100	85-95	60-80	25-40	3-15
	12-76	Clay loam	CL	A-6	0	100	100	90-100	70-80	30-40	11-20
BIB*: Bienville	0-84	Loamy fine sand	SM	A-2-4, A-4	0	100	100	90-100	17-50	<25	NP-3
Alaga	0-80	Loamy sand, sand	SM, SW-SM, SP-SM	A-2, A-1-B	0	100	100	40-70	10-35	---	NP
BOE*: Bonwier	0-9	Fine sandy loam	SM, ML	A-4	0-1	85-100	75-100	65-100	36-60	<30	NP-7
	9-33	Clay	CL, CH	A-7	0-1	85-100	75-100	65-100	51-98	45-60	25-38
	33-60	Variable	---	---	---	---	---	---	---	---	---
Stringtown	0-10	Fine sandy loam	SM, SM-SC, ML, CL-ML	A-4	0-1	90-100	85-100	70-85	36-55	<30	NP-7
	10-45	Sandy clay loam, clay loam.	SC, CL	A-4, A-6	0-1	80-100	70-100	65-100	36-65	20-40	8-20
	45-60	Variable	---	---	---	---	---	---	---	---	---
BrD*: Browndell	0-4	Loam	SM-SC, SC, CL, CL-ML	A-4, A-6	0-15	90-100	85-100	70-85	40-55	21-30	4-11
	4-15	Clay, silty clay	CH	A-7	0	85-100	85-100	80-100	75-95	52-76	30-50
	15-30	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
BuD Burkeville	0-65	Clay	CH	A-7-6	0	98-100	98-100	90-100	80-98	55-80	35-55

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
CRB*:											
Corrigan	0-8	Fine sandy loam	ML, CL, SM, SC	A-4, A-6	0	100	100	70-100	35-55	21-30	2-11
	8-32	Clay, silty clay	CH	A-7	0	100	100	90-100	65-95	52-76	30-50
	32-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rayburn	0-9	Fine sandy loam	CL-ML, ML, SM, SM-SC	A-4, A-2-4	0	100	100	70-99	25-65	<25	NP-7
	9-55	Clay, silty clay	CH	A-7	0	100	100	90-100	75-95	51-80	25-50
	55-70	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
De* Deweyville	0-4	Mucky silt loam	ML	A-4	0-5	98-100	95-100	95-100	90-100	<20	NP-4
	4-36	Hemic material	Pt	A-8	0-5	---	---	---	---	---	---
	36-70	Hemic material, sapric material.	Pt	A-8	0-5	---	---	---	---	---	---
DUB*:											
Doucette	0-24	Loamy fine sand	SM	A-2-4, A-4	0	97-100	95-100	80-98	15-40	<25	NP-4
	24-80	Sandy clay loam	SC, SM-SC, CL, CL-ML	A-4, A-6	0	95-100	95-100	85-98	36-55	25-39	6-18
Boykin	0-24	Loamy fine sand	SM	A-2-4, A-4	0	97-100	95-100	70-98	17-45	<25	NP-4
	24-80	Fine sandy loam, sandy clay loam.	SC, CL	A-4, A-6, A-7-6	0	95-100	95-100	80-98	36-55	22-45	8-30
EaA Evadale	0-11	Silt loam	ML, CL, CL-ML	A-4	0	100	95-100	90-100	75-100	<31	NP-10
	11-17	Silty clay loam, clay loam, loam.	CL	A-6	0	100	100	95-100	90-100	30-40	11-18
	17-65	Clay, silty clay, silty clay loam.	CH, CL	A-7, A-6	0	100	100	95-100	90-100	35-65	18-40
EdA Evadale	0-26	Silty clay loam	ML, CL, CL-ML	A-4, A-6	0	100	95-100	90-100	75-100	<37	NP-16
	26-65	Clay, silty clay, silty clay loam.	CH, CL	A-7, A-6	0	100	100	95-100	90-100	35-65	18-40
EgB*:											
Evadale	0-10	Silt loam	ML, CL, CL-ML	A-4	0	100	95-100	90-100	75-100	<31	NP-10
	10-18	Silty clay loam, clay loam, loam.	CL	A-6	0	100	100	95-100	90-100	30-40	11-18
	18-70	Clay, silty clay, silty clay loam.	CH, CL	A-7, A-6	0	100	100	95-100	90-100	35-65	18-40
Gist	0-16	Very fine sandy loam.	ML, CL-ML	A-4	0	98-100	98-100	95-100	60-90	<25	NP-7
	16-41	Loam, silt loam	ML, CL-ML, CL	A-4	0	98-100	98-100	95-100	70-95	<30	NP-10
	41-80	Clay loam, silty clay, clay.	CH, CL	A-7-6	0	98-100	98-100	98-100	75-98	41-60	19-35
EvA*:											
Evadale	0-11	Loam	ML, CL, CL-ML	A-4	0	100	95-100	90-100	75-100	<31	NP-10
	11-20	Silty clay loam, clay loam, loam.	CL	A-6	0	100	100	95-100	90-100	30-40	11-18
	20-65	Clay, silty clay, silty clay loam.	CH, CL	A-7, A-6	0	100	100	95-100	90-100	35-65	18-40
Vidrine	0-18	Very fine sandy loam.	ML, CL-ML	A-4	0	100	100	100	90-100	<27	NP-7
	18-44	Silty clay, silty clay loam.	CH, CL	A-7-6	0	100	100	100	90-100	41-60	19-32
	44-60	Silty clay loam, silty clay.	CL, CH	A-7-6, A-6	0	90-100	85-100	85-100	75-100	33-55	12-28

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
GAB*:											
Gallime----------	0-26	Fine sandy loam	SM, SC, CL, ML	A-4	0	95-100	95-100	90-100	45-65	<28	NP-10
	26-62	Sandy clay loam, clay loam, loam.	CL, SC	A-6, A-4	0	95-100	95-100	90-100	45-80	25-40	8-24
Spurger----------	0-13	Fine sandy loam	SM, ML, CL-ML, SM-SC	A-4	0	95-100	90-100	70-95	40-75	<20	NP-7
	13-58	Clay, clay loam	CH, CL	A-7-6	0	95-100	95-100	90-100	70-95	45-70	20-40
	58-72	Stratified fine sandy loam to sand.	SM-SC, SM, SW-SM	A-2-4, A-4	0	95-100	90-100	50-80	5-50	<20	NP-7
Gw*--------------- Gladewater	0-4	Clay loam--------	CH, CL	A-7	0	100	100	90-100	80-95	48-75	25-50
	4-65	Clay, silty clay	CH	A-7	0	100	100	95-100	90-100	51-75	30-50
Iu*--------------- Iuka	0-14	Fine sandy loam	SM, SM-SC, ML, CL-ML	A-4	0	95-100	90-100	70-95	45-75	<30	NP-7
	14-64	Fine sandy loam, loam, sandy loam.	SM, SM-SC, ML, CL-ML	A-4	0	95-100	85-100	65-100	36-75	<30	NP-7
JaA--------------- Jasco	0-23	Silt loam--------	ML	A-4	0	100	95-100	90-100	80-97	<25	NP-4
	23-44	Silt loam, loam	CL-ML, CL, ML	A-4	0	100	95-100	90-100	65-95	<30	NP-10
	44-65	Silty clay loam, clay loam, loam.	CL	A-4, A-6, A-7-6	0	100	95-100	90-100	65-90	25-45	8-22
KJB*:											
Kirbyville-------	0-22	Fine sandy loam	CL-ML, ML, CL	A-4	0	90-100	90-100	85-100	51-80	<25	NP-8
	22-72	Sandy clay loam, loam.	CL	A-6, A-4, A-7-6	0	90-100	90-100	85-100	51-85	25-42	8-25
Jasco------------	0-23	Silt loam--------	ML	A-4	0	100	95-100	90-100	80-97	<25	NP-4
	23-40	Silt loam, loam	CL-ML, CL, ML	A-4	0	100	95-100	90-100	65-95	15-30	2-10
	40-62	Silty clay loam, clay loam, loam.	CL	A-4, A-6, A-7-6	0	100	95-100	90-100	65-90	25-45	8-22
KWB*:											
Kirbyville-------	0-18	Fine sandy loam	CL-ML, ML, CL	A-4	0	90-100	90-100	85-100	51-80	<25	NP-8
	18-75	Sandy clay loam, loam.	CL	A-6, A-4, A-7-6	0	90-100	90-100	85-100	51-85	25-42	8-25
Waller-----------	0-23	Very fine sandy loam.	ML, CL-ML	A-4	0	100	98-100	95-100	51-75	<25	NP-6
	23-72	Loam, sandy clay loam, clay loam.	CL, CL-ML	A-4, A-6	0	100	98-100	95-100	60-90	20-40	4-20
KAE*:											
Kisatchie--------	0-5	Fine sandy loam	SM, ML, CL-ML, SM-SC	A-4	0	100	100	85-100	40-65	<25	NP-4
	5-35	Silty clay, silty clay loam, clay loam.	CH, CL	A-7-6	0	100	100	90-100	85-95	45-65	22-36
	35-62	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rayburn----------	0-5	Fine sandy loam	CL-ML, ML, SM, SM-SC	A-4, A-2-4	0	100	100	70-99	25-65	<25	NP-7
	5-42	Clay, silty clay	CH	A-7	0	100	100	90-100	75-95	51-80	25-50
	42-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
LTC*:											
Letney	0-34	Loamy sand	SM, SP-SM	A-2	0	90-100	90-100	50-75	10-30	<20	NP
	34-70	Sandy clay loam, sandy loam.	SC, SM-SC	A-6, A-4	0	90-100	90-100	65-90	36-50	20-40	5-20
Tehran	0-44	Loamy sand	SM	A-2-4	0	90-100	90-100	50-80	15-30	<20	NP-3
	44-70	Sandy clay loam, sandy loam.	SC, SM-SC	A-4, A-6, A-2-4	0	90-100	90-100	60-80	24-50	20-37	5-16
MaB Malbis	0-13	Fine sandy loam	SM, ML	A-4	0	100	96-100	92-97	40-62	<30	NP-5
	13-36	Loam, sandy clay loam, clay loam.	CL-ML, CL	A-4, A-6	0	99-100	95-100	91-100	53-70	25-35	5-11
	36-72	Sandy clay loam, clay loam.	ML, CL	A-4, A-5, A-6, A-7	0	98-100	96-100	90-100	56-80	29-49	4-18
MKB*:											
Malbis	0-24	Fine sandy loam	SM, ML	A-4	0	100	96-100	92-97	40-62	<30	NP-5
	24-72	Sandy clay loam, clay loam.	ML, CL	A-4, A-5, A-6, A-7	0	98-100	96-100	90-100	53-80	29-49	4-18
Kirbyville	0-12	Fine sandy loam	CL-ML, ML, CL	A-4	0	90-100	90-100	85-100	51-80	<25	NP-8
	12-65	Sandy clay loam, loam.	CL	A-6, A-4, A-7-6	0	90-100	90-100	85-100	51-85	25-42	8-25
Mn*:											
Mantachie	0-8	Loam	ML, CL-ML, CL	A-4	0	100	100	90-100	70-85	<30	NP-10
	8-60	Loam, clay loam, sandy clay loam.	CL, SC, SM-SC, CL-ML	A-4, A-6	0-5	95-100	90-100	80-95	45-80	20-40	5-15
Bleakwood	0-3	Fine sandy loam	ML, SM, CL-ML, SM-SC	A-4	0	95-100	90-100	60-85	40-75	18-28	2-9
	3-72	Loam, clay loam, fine sandy loam.	CL, SC, CL-ML, SM-SC	A-6, A-4	0	95-100	90-100	80-95	45-80	20-40	5-15
Mo* Melhomes	0-8	Loamy sand	SP-SM	A-2-4, A-3	0	100	98-100	60-85	5-12	---	NP
	8-65	Coarse sand, sand, loamy sand.	SP-SM, SP, SM	A-2-4, A-3	0	100	90-100	51-80	3-15	---	NP
Mr* Mooreville	0-12	Loam	CL-ML, CL, SM-SC, SC	A-4	0	100	100	80-100	40-85	20-30	5-10
	12-64	Sandy clay loam, clay loam, loam.	CL, SC	A-6, A-7	0	100	100	80-95	45-80	28-50	15-30
	64-70	Loam, sandy clay loam, clay loam.	SC, CL	A-6, A-7	0	100	100	80-95	45-80	28-50	15-30
NEB*:											
Newco	0-10	Fine sandy loam	SM, ML	A-4	0	95-100	95-100	80-100	40-65	<20	NP-3
	10-48	Clay, silty clay	CL, CH	A-7-6	0	95-100	95-100	90-100	80-95	45-70	20-40
	48-80	Variable	---	---	---	---	---	---	---	---	---
Urland	0-17	Fine sandy loam	SM	A-4	0-2	85-100	85-98	65-90	36-50	<25	NP-4
	17-50	Clay, sandy clay, clay loam.	CH, MH, CL, ML	A-7-6	0	95-100	85-100	85-99	51-75	41-60	15-30
	50-65	Variable	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
NEE*: Newco	0-8	Fine sandy loam	SM, ML	A-4	0	95-100	95-100	80-100	40-65	<20	NP-3
	8-44	Clay, silty clay	CL, CH	A-7-6	0	95-100	95-100	90-100	80-95	45-70	20-40
	44-65	Variable	---	---	---	---	---	---	---	---	---
Urland	0-7	Fine sandy loam	SM	A-4	0-2	85-100	85-98	65-90	36-50	<25	NP-4
	7-30	Clay, sandy clay, clay loam.	CH, MH, CL, ML	A-7-6	0	95-100	85-100	85-99	51-75	41-60	15-30
	30-44	Sandy clay loam, clay loam, sandy loam.	SC, SM-SC, CL, CL-ML	A-6, A-4	0	95-100	85-100	85-99	36-70	20-40	4-20
	44-65	Variable	---	---	---	---	---	---	---	---	---
NfC Nikful	0-18	Fine sandy loam	SM, CL-ML, SM-SC, ML	A-4	0	100	100	70-85	40-55	<25	NP-7
	18-48	Clay, clay loam	CH	A-7-6	0	100	100	90-100	75-95	52-76	30-50
	48-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
NKB*: Niwana	0-25	Fine sandy loam	SM, ML, CL-ML, SM-SC	A-4	0	98-100	95-100	90-100	45-70	<25	NP-7
	25-75	Sandy clay loam, loam.	SC, CL	A-4, A-6	0	98-100	95-100	90-100	36-80	20-38	7-22
Kirbyville	0-10	Fine sandy loam	CL-ML, ML, CL	A-4	0	90-100	90-100	85-100	51-80	<25	NP-8
	10-72	Sandy clay loam, loam.	CL	A-6, A-4, A-7-6	0	90-100	90-100	85-100	51-85	25-42	8-25
Oc* Ochlockonee	0-21	Fine sandy loam	SM, ML, SM-SC, CL-ML	A-4	0	100	95-100	95-100	36-80	<26	NP-5
	21-60	Fine sandy loam, sandy loam, loam.	SM, ML, SC, CL	A-4	0	100	95-100	95-100	36-75	<32	NP-9
PIC*: Pinetucky	0-13	Fine sandy loam	SM, SM-SC	A-4	0	85-100	85-100	65-80	36-45	<25	NP-7
	13-27	Sandy clay loam, clay loam.	SC, CL	A-4, A-6	0	90-100	90-100	80-95	45-65	20-40	8-20
	27-80	Sandy clay loam, clay loam.	SC, CL	A-4, A-6	0	95-100	90-100	80-95	45-65	20-40	8-20
Doucette	0-26	Loamy fine sand	SM	A-2-4, A-4	0	97-100	95-100	80-98	15-40	<25	NP-4
	26-80	Sandy clay loam	SC, SM-SC, CL, CL-ML	A-4, A-6	0	95-100	95-100	85-98	36-55	25-39	6-18
RAB*: Rayburn	0-7	Fine sandy loam	CL-ML, ML, SM, SM-SC	A-4, A-2-4	0	100	100	70-99	25-65	<25	NP-7
	7-47	Clay, silty clay	CH	A-7	0	100	100	90-100	75-95	51-80	25-50
	47-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Corrigan	0-8	Fine sandy loam	ML, CL, SM, SC	A-4, A-6	0	100	100	70-100	35-55	21-30	2-11
	8-40	Clay, silty clay	CH	A-7	0	100	100	90-100	65-95	52-76	30-50
	40-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
RBE*:											
Rayburn----------	0-7	Fine sandy loam	CL-ML, ML, SM, SM-SC	A-4, A-2-4	0	100	100	70-99	25-65	<25	NP-7
	7-45	Clay, silty clay	CH	A-7	0	100	100	90-100	75-95	51-80	25-50
	45-65	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Kisatchie--------	0-12	Fine sandy loam	SM, ML, CL-ML, SM-SC	A-4	0	100	100	85-100	40-65	<25	NP-4
	12-34	Silty clay, silty clay loam, clay loam.	CH, CL	A-7-6	0	100	100	90-100	85-95	45-65	22-36
	34-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
REB*:											
Redco------------	0-5	Clay--------------	CH	A-7-6	0	98-100	90-100	85-100	65-95	75-90	48-60
	5-65	Clay--------------	CH	A-7-6	0	98-100	90-100	85-100	65-95	75-90	48-60
Woodville--------	0-9	Fine sandy loam	SM, ML, SM-SC, CL-ML	A-4	0	95-100	95-100	75-95	45-70	<30	NP-7
	9-65	Clay--------------	CH	A-7	0	95-100	95-100	90-100	75-95	51-70	30-45
RPB*:											
Rogan------------	0-16	Gravelly fine sandy loam.	SM, SM-SC	A-2-4, A-4	0	70-90	50-85	45-85	25-48	<25	NP-6
	16-26	Gravelly sandy clay loam, gravelly clay loam.	SC, CL	A-6, A-2-6, A-4, A-2-4	0	70-95	50-95	45-90	24-76	20-40	8-20
	26-65	Sandy clay loam, clay loam.	SC, CL	A-6, A-4	0	95-100	85-98	65-98	36-80	20-40	8-20
Pinetucky--------	0-14	Fine sandy loam	SM, SM-SC	A-4	0	85-100	85-100	65-80	36-45	<25	NP-7
	14-65	Sandy clay loam, clay loam.	SC, CL	A-4, A-6	0	95-100	90-100	80-95	45-65	20-40	8-20
SBC*:											
Shankler---------	0-42	Loamy fine sand	SM	A-2-4	0	95-100	95-100	60-90	15-30	<20	NP-3
	42-65	Sandy clay loam	SC, CL	A-6, A-7-6	0	95-100	95-100	80-95	36-55	25-45	11-30
Boykin-----------	0-26	Loamy fine sand	SM	A-2-4, A-4	0	97-100	95-100	70-98	17-45	<25	NP-4
	26-75	Fine sandy loam, sandy clay loam.	SC, CL	A-4, A-6, A-7-6	0	95-100	95-100	80-98	36-55	22-45	8-30
SBE*:											
Shankler---------	0-43	Loamy fine sand	SM	A-2-4	0	95-100	95-100	60-90	15-30	<20	NP-3
	43-65	Sandy clay loam	SC, CL	A-6, A-7-6	0	95-100	95-100	80-95	36-55	25-45	11-30
	65-75	Sandy clay loam, sandy loam, fine sandy loam.	SC, SM-SC	A-2-4, A-4, A-6, A-2-6	0	95-100	95-100	75-90	25-50	20-40	5-20
Boykin-----------	0-22	Loamy fine sand	SM	A-2-4, A-4	0	97-100	95-100	70-98	17-45	<25	NP-4
	22-72	Fine sandy loam, sandy clay loam.	SC, CL	A-4, A-6, A-7-6	0	95-100	95-100	80-98	36-55	22-45	8-30

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
SMB*:											
Spurger----------	0-9	Loam--------------	SM, ML, CL-ML, SM-SC	A-4	0	95-100	90-100	70-95	40-75	<20	NP-7
	9-36	Clay, clay loam	CH, CL	A-7-6	0	95-100	95-100	90-100	70-95	45-70	20-40
	36-65	Sandy clay loam, clay loam, loam.	CL, SC, SM-SC, CL-ML	A-4, A-6	0	95-100	90-100	80-100	45-80	20-40	4-20
	65-80	Stratified fine sandy loam to sand.	SM-SC, SM, SW-SM	A-2-4, A-4	0	95-100	90-100	50-80	5-50	<20	NP-7
Mollville--------	0-15	Silt loam---------	ML, CL-ML, CL	A-4, A-6	0	100	100	85-95	60-80	25-40	3-15
	15-75	Clay loam, silty clay loam, sandy clay loam.	CL	A-6	0	100	100	90-100	70-80	30-40	11-20
STE*:											
Stringtown-------	0-11	Fine sandy loam	SM, SM-SC, ML, CL-ML	A-4	0-1	90-100	85-100	70-85	36-55	<30	NP-7
	11-54	Sandy clay loam, clay loam.	SC, CL	A-4, A-6	0-1	80-100	70-100	65-100	36-65	20-40	8-20
	54-80	Variable----------	---	---	---	---	---	---	---	---	---
Bonwier----------	0-8	Fine sandy loam	SM, ML	A-4	0-1	85-100	75-100	65-100	36-60	<30	NP-7
	8-36	Clay--------------	CL, CH	A-7	0-1	85-100	75-100	65-100	51-98	45-60	25-38
	36-60	Variable----------	---	---	---	---	---	---	---	---	---
SXC*:											
Stringtown-------	0-54	Sandy clay loam	SC, CL	A-4, A-6	0-1	80-100	70-100	65-100	36-65	20-40	8-20
	54-80	Variable----------	---	---	---	---	---	---	---	---	---
Bonwier----------	0-8	Fine sandy loam	SM, ML	A-4	0-1	85-100	75-100	65-100	36-60	<30	NP-7
	8-36	Clay--------------	CL, CH	A-7	0-1	85-100	75-100	65-100	51-98	45-60	25-38
	36-60	Variable----------	---	---	---	---	---	---	---	---	---
TaB--------------- Tahoula	0-13	Clay--------------	CH	A-7-6	0	98-100	95-100	95-100	75-98	55-80	35-55
	13-65	Clay--------------	CH	A-7-6	0	98-100	90-100	90-100	75-95	55-80	35-55
TaD--------------- Tahoula	0-8	Clay--------------	CH	A-7-6	0	98-100	95-100	95-100	75-98	55-80	35-55
	8-65	Clay, silty clay	CH	A-7-6	0	98-100	90-100	90-100	75-95	55-80	35-55
TLE*:											
Tehran-----------	0-51	Loamy sand--------	SM	A-2-4	0	90-100	90-100	50-80	15-30	<20	NP-3
	51-75	Sandy clay loam, sandy loam.	SC, SM-SC	A-4, A-6, A-2-4	0	90-100	90-100	60-80	24-50	20-37	5-16
Letney-----------	0-34	Loamy sand--------	SM, SP-SM	A-2	0	90-100	90-100	50-75	10-30	<20	NP
	34-75	Sandy clay loam, sandy loam.	SC, SM-SC	A-6, A-4	0	90-100	90-100	65-90	36-50	20-40	5-20
Um*:											
Urbo-------------	0-65	Silty clay, clay loam, silty clay loam.	CL, CH	A-7	0	100	100	95-100	80-98	44-62	20-36
Mantachie--------	0-8	Loam--------------	CL-ML, SM-SC, SM, ML	A-4	0-5	95-100	90-100	60-85	40-60	<20	NP-5
	8-72	Loam, clay loam, sandy clay loam.	CL, SC, SM-SC, CL-ML	A-4, A-6	0-5	95-100	90-100	80-95	45-80	20-40	5-15

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
UPB*:											
Urland----------	0-10	Fine sandy loam	SM	A-4	0-2	85-100	85-98	65-90	36-50	<25	NP-4
	10-24	Clay, sandy clay, clay loam.	CH, MH, CL, ML	A-7-6	0	95-100	85-100	85-99	51-75	41-60	15-30
	24-48	Sandy clay loam, clay loam, sandy loam.	SC, SM-SC, CL, CL-ML	A-6, A-4	0	95-100	85-100	85-99	36-70	20-40	4-20
	48-65	Variable---------	---	---	---	---	---	---	---	---	---
Pinetucky--------	0-14	Fine sandy loam	SM, SM-SC	A-4	0	85-100	85-100	65-80	36-45	<25	NP-7
	14-54	Sandy clay loam, clay loam.	SC, CL	A-4, A-6	0	90-100	90-100	80-95	45-65	20-40	8-20
	54-72	Sandy clay loam, clay loam.	SC, CL	A-4, A-6	0	95-100	90-100	80-95	45-65	20-40	8-20
WAA*:											
Waller----------	0-16	Very fine sandy loam.	ML, CL-ML	A-4	0	100	98-100	95-100	51-75	<25	NP-6
	16-64	Loam, sandy clay loam, clay loam.	CL, CL-ML	A-4, A-6	0	100	98-100	95-100	60-90	20-40	4-20
Evadale---------	0-17	Silt loam--------	ML, CL, CL-ML	A-4	0	100	95-100	90-100	75-100	<31	NP-10
	17-72	Clay, silty clay, silty clay loam.	CH, CL	A-7, A-6	0	100	100	95-100	90-100	35-65	18-40
WgC---------------	0-21	Clay--------------	CH	A-7-6	0	100	95-100	90-100	80-98	55-80	35-55
Wiergate	21-75	Clay--------------	CH	A-7-6	0	98-100	95-100	90-100	80-98	55-85	35-60
WTB*:											
Woodville--------	0-9	Fine sandy loam	SM, ML, SM-SC, CL-ML	A-4	0	95-100	95-100	75-95	45-70	<30	NP-7
	9-65	Clay--------------	CH	A-7	0	95-100	95-100	90-100	75-95	51-70	30-45
	65-80	Clay, clay loam	CH, CL	A-7	0	95-100	95-100	90-100	75-95	41-55	25-35
Redco-----------	0-72	Clay--------------	CH	A-7-6	0	98-100	90-100	85-100	65-95	75-90	48-60

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Soil name and map symbol	Depth	Clay <2mm	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cm^3	In/hr	In/in	pH				Pct
AtA	0-11	8-20	1.30-1.50	2.0-6.0	0.11-0.15	5.1-6.5	Low	0.24	5	<1
Attoyac	11-72	18-32	1.35-1.60	0.6-2.0	0.12-0.17	5.1-6.5	Low	0.32		
BaB*:										
Bernaldo	0-8	5-15	1.30-1.50	2.0-6.0	0.11-0.15	5.1-6.5	Low	0.32	5	<1
	8-43	18-30	1.35-1.60	0.6-2.0	0.15-0.20	4.5-6.5	Moderate	0.32		
	43-75	10-30	1.35-1.60	0.6-2.0	0.15-0.20	4.5-6.5	Low	0.32		
Besner	0-22	5-15	1.30-1.50	2.0-6.0	0.11-0.15	4.5-6.5	Low	0.24	5	<1
	22-37	14-18	1.35-1.60	0.6-2.0	0.15-0.20	4.5-6.5	Low	0.32		
	37-70	15-30	1.35-1.60	0.6-2.0	0.15-0.20	4.5-6.5	Low	0.32		
BeB*:										
Besner	0-22	5-15	1.30-1.50	2.0-6.0	0.11-0.15	4.5-6.5	Low	0.24	5	<1
	22-28	14-18	1.35-1.60	0.6-2.0	0.15-0.20	4.5-6.5	Low	0.32		
	28-65	15-30	1.35-1.60	0.6-2.0	0.15-0.20	4.5-6.5	Low	0.32		
Mollville	0-12	10-20	1.40-1.65	0.2-0.6	0.15-0.20	4.5-6.0	Low	0.32	5	0.5-2
	12-76	22-35	1.50-1.70	0.06-0.2	0.15-0.20	5.1-7.8	Moderate	0.32		
BIB*:										
Bienville	0-84	5-15	1.35-1.60	2.0-6.0	0.08-0.11	4.5-6.5	Low	0.20	5	.5-2
Alaga	0-80	2-12	1.35-1.60	>6.0	0.05-0.09	4.5-6.0	Low	0.17	5	.5-1
BOE*:										
Bonwier	0-9	8-20	1.20-1.40	2.0-6.0	0.11-0.15	4.5-6.0	Low	0.32	3	<1
	9-33	40-60	1.30-1.50	0.2-0.6	0.12-0.18	4.5-5.5	Moderate	0.32		
	33-60	---	---	---	---	---	---	---		
Stringtown	0-10	8-18	1.20-1.40	0.6-2.0	0.11-0.15	4.5-6.5	Low	0.32	3	<1
	10-45	18-35	1.35-1.55	0.6-2.0	0.15-0.20	4.5-5.5	Low	0.28		
	45-60	---	---	---	---	---	---	---		
BrD*:										
Browndell	0-4	8-20	1.20-1.40	0.6-2.0	0.11-0.15	4.5-6.5	Low	0.43	2	<1
	4-15	40-60	1.30-1.50	<0.06	0.12-0.18	4.5-6.0	High	0.32		
	15-30	---	---	---	---	---	---	---		
Rock outcrop.										
BuD	0-65	60-80	1.35-1.55	<0.06	0.15-0.18	7.9-8.4	Very high	0.32	5	.5-2
Burkeville										
CRB*:										
Corrigan	0-8	5-15	1.20-1.35	0.6-2.0	0.11-0.15	4.5-6.0	Low	0.43	3	.5-3
	8-32	40-60	1.20-1.50	<0.06	0.12-0.18	3.6-5.5	High	0.32		
	32-60	---	---	---	---	---	---	---		
Rayburn	0-9	8-20	1.20-1.40	0.6-2.0	0.11-0.15	4.5-6.0	Low	0.43	3	<1
	9-55	40-60	1.30-1.50	<0.06	0.12-0.18	3.6-5.5	High	0.37		
	55-70	---	---	---	---	---	---	---		
De*	0-4	2-10	---	2.0-6.0	0.45-0.50	3.6-4.4	Low	---	---	---
Deweyville	4-36	---	---	2.0-6.0	0.45-0.50	3.6-4.4	Low	---		
	36-70	---	---	2.0-6.0	0.45-0.50	3.6-4.4	Low	---		
DUB*:										
Doucette	0-24	3-10	1.30-1.50	6.0-20	0.07-0.11	5.1-6.0	Low	0.20	5	<1
	24-80	20-35	1.35-1.60	0.6-2.0	0.13-0.17	4.5-5.5	Low	0.24		
Boykin	0-24	3-10	1.30-1.50	6.0-20	0.07-0.11	4.5-6.5	Low	0.20	5	<1
	24-80	18-30	1.35-1.60	0.6-2.0	0.13-0.17	4.5-6.0	Low	0.24		

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Clay <2mm	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cm^3	In/hr	In/in	pH				Pct
EaA	0-11	5-18	1.20-1.50	0.2-0.6	0.16-0.22	4.5-6.0	Low	0.43	5	<2
Evadale	11-17	18-35	1.20-1.50	0.06-0.2	0.18-0.22	4.5-5.5	Low	0.32		
	17-65	35-60	1.30-1.60	<0.06	0.14-0.20	4.5-5.5	Moderate	0.32		
EdA	0-26	5-18	1.20-1.50	0.2-0.6	0.16-0.22	4.5-6.0	Low	0.43	5	<2
Evadale	26-65	35-60	1.30-1.60	<0.06	0.14-0.20	4.5-5.5	Moderate	0.32		
EgB*:										
Evadale	0-10	5-18	1.20-1.50	0.2-0.6	0.16-0.22	4.5-6.0	Low	0.43	5	<2
	10-18	18-35	1.20-1.50	0.06-0.2	0.18-0.22	4.5-5.5	Low	0.32		
	18-70	35-60	1.30-1.60	<0.06	0.14-0.20	4.5-5.5	Moderate	0.32		
Gist	0-16	3-12	1.20-1.40	0.6-2.0	0.13-0.20	5.1-6.0	Low	0.37	5	<1
	16-41	8-18	1.20-1.40	0.6-2.0	0.13-0.20	4.5-5.5	Low	0.37		
	41-80	35-60	1.30-1.50	<0.06	0.15-0.20	4.5-6.5	High	0.32		
EvA*:										
Evadale	0-11	5-18	1.20-1.50	0.2-0.6	0.16-0.22	4.5-6.0	Low	0.43	5	<2
	11-20	18-35	1.20-1.50	0.06-0.2	0.18-0.22	4.5-5.5	Low	0.32		
	20-65	35-60	1.30-1.60	<0.06	0.14-0.20	4.5-5.5	Moderate	0.32		
Vidrine	0-18	10-27	1.30-1.65	0.6-2.0	0.20-0.23	4.5-6.0	Low	0.43	4	2-4
	18-44	27-50	1.18-1.80	0.06-0.2	0.18-0.20	4.5-6.0	High	0.32		
	44-60	27-50	1.25-1.80	0.06-0.2	0.18-0.20	6.1-8.4	High	0.32		
GAB*:										
Gallime	0-26	10-20	1.20-1.50	2.0-6.0	0.11-0.15	5.1-7.3	Low	0.32	5	<1
	26-62	18-35	1.35-1.60	0.6-2.0	0.12-0.17	4.5-6.5	Moderate	0.32		
Spurger	0-13	8-18	1.10-1.40	0.6-2.0	0.11-0.20	4.5-5.5	Low	0.43	5	0.5-2
	13-58	35-60	1.20-1.50	0.06-0.2	0.12-0.18	4.5-5.5	Moderate	0.32		
	58-72	2-20	1.20-1.50	0.6-6.0	0.05-0.15	4.5-5.5	Low	0.32		
Gw*	0-4	30-60	1.30-1.60	0.06-0.2	0.15-0.20	5.6-7.3	High	0.32	5	1-3
Gladewater	4-65	40-60	1.35-1.60	<0.06	0.15-0.18	4.5-8.4	High	0.32		
Iu*	0-14	6-15	1.20-1.50	0.6-2.0	0.10-0.20	5.1-6.0	Low	0.24	5	.5-2
Iuka	14-64	8-18	1.25-1.50	0.6-2.0	0.10-0.20	4.5-5.5	Low	0.28		
JaA	0-23	5-18	1.40-1.60	0.6-2.0	0.12-0.22	3.6-5.5	Low	0.43	3	<2
Jasco	23-44	10-25	1.70-1.90	<0.06	0.-0.05	3.6-5.5	Low	0.37		
	44-65	15-35	1.60-1.80	0.06-0.2	0.-0.05	3.6-5.5	Low	0.37		
KJB*:										
Kirbyville	0-22	5-15	1.35-1.60	2.0-6.0	0.11-0.15	4.5-6.0	Low	0.32	5	<1
	22-72	18-30	1.50-1.70	0.6-2.0	0.15-0.20	4.5-5.5	Low	0.28		
Jasco	0-23	5-18	1.40-1.60	0.6-2.0	0.12-0.22	3.6-5.5	Low	0.43	3	<2
	23-40	10-25	1.70-1.90	<0.06	0.-0.05	3.6-5.5	Low	0.37		
	40-62	15-35	1.60-1.80	0.06-0.2	0.-0.05	3.6-5.5	Low	0.37		
KWB*:										
Kirbyville	0-18	5-15	1.35-1.60	2.0-6.0	0.11-0.15	4.5-6.0	Low	0.32	5	<1
	18-75	18-30	1.50-1.70	0.6-2.0	0.15-0.20	4.5-5.5	Low	0.28		
Waller	0-23	5-15	1.50-1.70	0.6-2.0	0.15-0.20	4.5-6.0	Low	0.43	5	.5-2
	23-72	18-30	1.50-1.70	0.6-2.0	0.15-0.20	5.6-7.3	Low	0.37		
KAE*:										
Kisatchie	0-5	10-27	1.35-1.65	0.6-2.0	0.12-0.20	4.5-5.5	Low	0.43	2	.5-2
	5-35	35-55	1.20-1.70	<0.06	0.15-0.18	3.6-5.0	High	0.32		
	35-62	---	---	---	---	---	---	---		
Rayburn	0-5	8-20	1.20-1.40	0.6-2.0	0.11-0.15	4.5-6.0	Low	0.43	3	<1
	5-42	40-60	1.30-1.50	<0.06	0.12-0.18	3.6-5.5	High	0.37		
	42-60	---	---	---	---	---	---	---		

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Clay <2mm	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cm^3	In/hr	In/in	pH				Pct
LTC*:										
Letney----------	0-34	2-8	1.40-1.60	6.0-20	0.06-0.10	4.5-6.0	Low----------	0.20	5	0.5-1
	34-70	18-35	1.40-1.60	2.0-6.0	0.12-0.17	4.5-6.0	Low----------	0.24		
Tehran----------	0-44	2-8	1.40-1.60	6.0-20	0.06-0.10	4.5-6.0	Low----------	0.20	5	.5-1
	44-70	18-32	1.40-1.60	2.0-6.0	0.12-0.17	4.5-6.0	Low----------	0.24		
MaB------------- Malbis	0-13	10-25	1.35-1.60	0.6-2.0	0.10-0.15	4.5-6.0	Low----------	0.28	5	.5-1
	13-36	22-35	1.40-1.60	0.6-2.0	0.12-0.20	4.5-5.5	Low----------	0.28		
	36-54	20-35	1.40-1.60	0.6-2.0	0.12-0.17	4.5-5.5	Low----------	0.28		
	54-72	20-35	1.40-1.60	0.2-0.6	0.12-0.17	4.5-5.5	Low----------	0.28		
MKB*:										
Malbis----------	0-24	10-25	1.35-1.60	0.6-2.0	0.10-0.15	4.5-6.0	Low----------	0.28	5	.5-1
	24-54	20-35	1.40-1.60	0.6-2.0	0.12-0.17	4.5-5.5	Low----------	0.28		
	54-72	20-35	1.40-1.60	0.2-0.6	0.12-0.17	4.5-5.5	Low----------	0.28		
Kirbyville------	0-12	5-15	1.35-1.60	2.0-6.0	0.11-0.15	4.5-6.0	Low----------	0.32	5	<1
	12-65	18-30	1.50-1.70	0.6-2.0	0.15-0.20	4.5-5.5	Low----------	0.28		
Mn*:										
Mantachie-------	0-8	10-20	1.40-1.50	0.6-2.0	0.16-0.20	4.5-5.5	Low----------	0.28	5	1-3
	8-60	18-34	1.50-1.60	0.6-2.0	0.14-0.20	4.5-5.5	Low----------	0.28		
Bleakwood-------	0-3	5-12	1.20-1.40	0.6-2.0	0.10-0.15	4.5-6.5	Low----------	0.28	5	<2
	3-72	12-35	1.20-1.40	0.6-2.0	0.14-0.20	4.5-5.5	Low----------	0.28		
Mo*-------------- Melhomes	0-8	1-8	1.10-1.30	6.0-20	0.03-0.10	4.5-6.0	Low----------	0.10	5	---
	8-65	1-8	1.20-1.40	>20	0.02-0.08	4.5-6.0	Low----------	0.10		
MR*------------- Mooreville	0-12	5-27	1.40-1.50	0.6-2.0	0.14-0.20	4.5-5.5	Low----------	0.37	5	.5-2
	12-64	18-35	1.40-1.50	0.6-2.0	0.14-0.18	4.5-5.5	Moderate-----	0.28		
	64-70	10-40	---	0.6-2.0	0.14-0.18	4.5-5.5	Moderate-----	0.28		
NEB*:										
Newco-----------	0-10	5-15	1.20-1.40	0.6-2.0	0.10-0.20	4.5-6.0	Low----------	0.37	3	<1
	10-48	40-60	1.30-1.50	0.06-0.2	0.12-0.18	4.5-5.5	High---------	0.32		
	48-80	---	---	---	---	---	-------------	----		
Urland----------	0-17	5-18	1.20-1.40	2.0-6.0	0.10-0.15	5.1-6.5	Low----------	0.37	4	<1
	17-50	35-55	1.30-1.50	0.2-0.6	0.12-0.18	4.5-5.5	Moderate-----	0.32		
	50-65	---	---	---	---	---	-------------	----		
NEE*:										
Newco-----------	0-8	5-15	1.20-1.40	0.6-2.0	0.10-0.20	4.5-6.0	Low----------	0.37	3	<1
	8-44	40-60	1.30-1.50	0.06-0.2	0.12-0.18	4.5-5.5	High---------	0.32		
	44-65	---	---	---	---	---	-------------	----		
Urland----------	0-7	5-18	1.20-1.40	2.0-6.0	0.10-0.15	5.1-6.5	Low----------	0.37	4	<1
	7-30	35-55	1.30-1.50	0.2-0.6	0.12-0.18	4.5-5.5	Moderate-----	0.32		
	30-44	17-40	1.35-1.55	0.6-2.0	0.12-0.17	4.5-5.5	Moderate-----	0.32		
	44-65	---	---	---	---	---	-------------	----		
NfC-------------- Nikful	0-18	10-20	1.20-1.40	0.6-2.0	0.11-0.15	4.5-6.0	Low----------	0.43	3	<1
	18-48	35-60	1.35-1.55	<0.06	0.12-0.18	3.6-6.0	High---------	0.37		
	48-60	---	---	---	---	---	-------------	----		
NKB*:										
Niwana----------	0-25	5-12	1.20-1.40	2.0-6.0	0.11-0.15	5.1-6.0	Low----------	0.24	5	<1
	25-75	18-35	1.40-1.60	0.6-2.0	0.15-0.20	4.5-5.5	Low----------	0.32		
Kirbyville------	0-10	5-15	1.35-1.60	2.0-6.0	0.11-0.15	4.5-6.0	Low----------	0.32	5	<1
	10-72	18-30	1.50-1.70	0.6-2.0	0.15-0.20	4.5-5.5	Low----------	0.28		

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Clay <2mm	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	G/cm^3	In/hr	In/in	pH				Pct
Oc*-----------------	0-21	3-18	1.20-1.40	2.0-6.0	0.07-0.14	4.5-5.5	Low-----------	0.20	5	.5-2
Ochlockonee	21-60	8-18	1.20-1.40	0.6-2.0	0.10-0.20	4.5-5.5	Low-----------	0.20		
PIC*:										
Pinetucky--------	0-13	8-20	1.30-1.50	2.0-6.0	0.10-0.15	4.5-6.0	Low-----------	0.32	5	<1
	13-27	20-35	1.35-1.60	0.2-0.6	0.15-0.20	4.5-5.5	Low-----------	0.32		
	27-80	20-35	1.35-1.60	0.2-0.6	0.15-0.20	4.5-5.5	Low-----------	0.28		
Doucette---------	0-26	3-10	1.30-1.50	6.0-20	0.07-0.11	5.1-6.0	Low-----------	0.20	5	<1
	26-80	20-35	1.35-1.60	0.6-2.0	0.13-0.17	4.5-5.5	Low-----------	0.24		
RAB*:										
Rayburn----------	0-7	8-20	1.20-1.40	0.6-2.0	0.11-0.15	4.5-6.0	Low-----------	0.43	3	<1
	7-47	40-60	1.30-1.50	<0.06	0.12-0.18	3.6-5.5	High----------	0.37		
	47-60	---	---	---	---	---	-------------	----		
Corrigan---------	0-8	5-15	1.20-1.35	0.6-2.0	0.11-0.15	4.5-6.0	Low-----------	0.43	3	.5-3
	8-40	40-60	1.20-1.30	<0.06	0.12-0.18	3.6-5.5	High----------	0.32		
	40-60	---	---	---	---	---	-------------	----		
RBE*:										
Rayburn----------	0-7	8-20	1.20-1.40	0.6-2.0	0.11-0.15	4.5-6.0	Low-----------	0.43	3	<1
	7-45	40-60	1.30-1.50	<0.06	0.12-0.18	3.6-5.5	High----------	0.37		
	45-65	---	---	---	---	---	-------------	----		
Kisatchie--------	0-12	10-27	1.35-1.65	0.6-2.0	0.12-0.20	4.5-5.5	Low-----------	0.43	2	.5-2
	12-34	35-55	1.20-1.70	<0.06	0.15-0.18	3.6-5.0	High----------	0.32		
	34-60	---	---	---	---	---	-------------	----		
REB*:										
Redco------------	0-5	50-80	1.25-1.40	<0.06	0.15-0.2	5.1-6.5	Very high----	0.32	5	.5-2
	5-65	60-80	1.30-1.60	<0.06	0.15-0.2	4.5-6.0	Very high----	0.32		
Woodville--------	0-9	5-18	1.20-1.40	0.6-2.0	0.13-0.18	4.5-6.5	Low-----------	0.43	5	<1
	9-65	40-60	1.40-1.60	<0.06	0.12-0.18	4.5-5.5	High----------	0.32		
RPB*:										
Rogan------------	0-16	8-20	1.10-1.40	2.0-6.0	0.10-0.15	5.1-6.0	Low-----------	0.32	5	<1
	16-26	20-35	1.20-1.50	0.6-2.0	0.15-0.20	4.5-5.5	Low-----------	0.24		
	26-65	20-35	1.20-1.50	0.2-0.6	0.15-0.20	4.5-5.5	Low-----------	0.24		
Pinetucky--------	0-14	8-20	1.30-1.50	2.0-6.0	0.10-0.15	4.5-6.0	Low-----------	0.32	5	<1
	14-65	20-35	1.35-1.60	0.2-0.6	0.15-0.20	4.5-5.5	Low-----------	0.28		
SBC*:										
Shankler---------	0-42	2-10	1.30-1.50	6.0-20	0.07-0.11	4.5-6.5	Low-----------	0.17	5	<1
	42-65	20-35	1.35-1.60	0.6-2.0	0.12-0.17	4.5-5.5	Low-----------	0.24		
Boykin-----------	0-26	3-10	1.30-1.50	6.0-20	0.07-0.11	4.5-6.5	Low-----------	0.20	5	<1
	26-75	18-30	1.35-1.60	0.6-2.0	0.13-0.17	4.5-6.0	Low-----------	0.24		
SBE*:										
Shankler---------	0-43	2-10	1.30-1.50	6.0-20	0.07-0.11	4.5-6.5	Low-----------	0.17	5	<1
	43-65	20-35	1.35-1.60	0.6-2.0	0.12-0.17	4.5-5.5	Low-----------	0.24		
	65-75	15-30	1.35-1.60	0.6-2.0	0.10-0.17	4.5-5.5	Low-----------	0.24		
Boykin-----------	0-22	3-10	1.30-1.50	6.0-20	0.07-0.11	4.5-6.5	Low-----------	0.20	5	<1
	22-72	18-30	1.35-1.60	0.6-2.0	0.13-0.17	4.5-6.0	Low-----------	0.24		
SMB*:										
Spurger----------	0-9	8-18	1.10-1.40	0.6-2.0	0.11-0.20	4.5-5.5	Low-----------	0.43	5	.5-2
	9-36	35-60	1.20-1.50	0.06-0.2	0.12-0.18	4.5-5.5	Moderate------	0.32		
	36-65	18-35	1.20-1.50	0.2-0.6	0.12-0.17	4.5-5.5	Low-----------	0.32		
	65-80	2-20	1.20-1.50	0.6-6.0	0.05-0.15	4.5-5.5	Low-----------	0.32		

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Clay <2mm	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	G/cm^3	In/hr	In/in	pH				Pct
SMB*:										
Mollville--------	0-15	10-20	1.40-1.65	0.2-0.6	0.15-0.20	4.5-6.0	Low-----------	0.32	5	0.5-2
	15-75	22-35	1.50-1.70	0.06-0.2	0.15-0.20	5.1-7.8	Moderate------	0.32		
STE*:										
Stringtown-------	0-11	8-18	1.20-1.40	0.6-2.0	0.11-0.15	4.5-6.5	Low-----------	0.32	3	<1
	11-54	18-35	1.35-1.55	0.6-2.0	0.15-0.20	4.5-5.5	Low-----------	0.28		
	54-80	---	---	---	---	---	-------------	----		
Bonwier----------	0-9	8-20	1.20-1.40	2.0-6.0	0.11-0.15	4.5-6.0	Low-----------	0.32	3	<1
	9-36	40-60	1.30-1.50	0.2-0.6	0.12-0.18	4.5-5.5	Moderate------	0.32		
	36-60	---	---	---	---	---	-------------	----		
SXC*:										
Stringtown-------	0-54	18-35	1.35-1.55	0.6-2.0	0.15-0.20	4.5-5.5	Low-----------	0.28	3	<1
	54-80	---	---	---	---	---	-------------	----		
Bonwier----------	0-2	8-20	1.20-1.40	2.0-6.0	0.11-0.15	4.5-6.0	Low-----------	0.32	3	<1
	2-38	40-60	1.30-1.50	0.2-0.6	0.12-0.18	4.5-5.5	Moderate------	0.32		
	38-60	---	---	---	---	---	-------------	----	---	---
TaB--------------- Tahoula	0-13	50-80	1.30-1.50	<0.06	0.12-0.18	5.6-8.4	High----------	0.32	5	<2
	13-65	60-80	1.40-1.60	<0.06	0.12-0.18	5.6-8.4	High----------	0.32		
TaD--------------- Tahoula	0-8	50-80	1.30-1.50	<0.06	0.12-0.18	5.6-8.4	High----------	0.32	5	<2
	8-65	60-80	1.40-1.60	<0.06	0.12-0.18	5.6-8.4	High----------	0.32		
TLE*:										
Tehran-----------	0-51	2-8	1.40-1.60	6.0-20	0.06-0.10	4.5-6.0	Low-----------	0.20	5	.5-1
	51-75	18-32	1.40-1.60	2.0-6.0	0.12-0.17	4.5-6.0	Low-----------	0.24		
Letney-----------	0-34	2-8	1.40-1.60	6.0-20	0.06-0.10	4.5-6.0	Low-----------	0.20	5	.5-1
	34-75	18-35	1.40-1.60	2.0-6.0	0.12-0.17	4.5-6.0	Low-----------	0.24		
Um*:										
Urbo-------------	0-65	35-55	1.45-1.55	<0.06	0.18-0.20	4.5-5.5	Moderate------	0.28	---	---
Mantachie--------	0-8	8-20	1.50-1.60	0.6-2.0	0.16-0.20	4.5-5.5	Low-----------	0.28	5	1-3
	8-72	18-34	1.50-1.60	0.6-2.0	0.14-0.20	4.5-5.5	Low-----------	0.28		
UPB*:										
Urland-----------	0-10	5-18	1.20-1.40	2.0-6.0	0.10-0.15	5.1-6.5	Low-----------	0.37	4	<1
	10-24	35-55	1.30-1.50	0.2-0.6	0.12-0.18	4.5-5.5	Moderate------	0.32		
	24-48	17-40	1.35-1.55	0.6-2.0	0.12-0.17	4.5-5.5	Moderate------	0.32		
	48-65	---	---	---	---	---	-------------	----		
Pinetucky--------	0-14	8-20	1.30-1.50	2.0-6.0	0.10-0.15	4.5-6.0	Low-----------	0.32	5	<1
	14-54	20-35	1.35-1.60	0.2-0.6	0.15-0.20	4.5-5.5	Low-----------	0.32		
	54-72	20-35	1.35-1.60	0.2-0.6	0.15-0.20	4.5-5.5	Low-----------	0.28		
WAA*:										
Waller-----------	0-16	5-15	1.50-1.70	0.6-2.0	0.15-0.20	4.5-6.0	Low-----------	0.43	5	.5-2
	16-64	18-30	1.50-1.70	0.6-2.0	0.15-0.20	5.6-7.3	Low-----------	0.37		
Evadale----------	0-17	5-18	1.20-1.50	0.2-0.6	0.16-0.22	4.5-6.0	Low-----------	0.43	5	<2
	17-72	35-60	1.30-1.60	<0.06	0.14-0.20	4.5-5.5	Moderate------	0.32		
WgC--------------- Wiergate	0-21	50-80	1.20-1.45	<0.06	0.15-0.18	6.6-7.8	Very high-----	0.32	5	1-4
	21-75	60-80	1.30-1.50	<0.06	0.15-0.18	7.9-8.4	Very high-----	0.32		
WTB*:										
Woodville--------	0-9	5-18	1.20-1.40	0.6-2.0	0.13-0.18	4.5-6.5	Low-----------	0.43	5	<1
	9-65	40-60	1.40-1.60	<0.06	0.12-0.18	4.5-5.5	High----------	0.32		
	65-80	30-60	1.40-1.60	<0.06	0.12-0.18	5.1-8.4	High----------	0.32		
Redco------------	0-72	50-80	1.25-1.40	<0.06	0.15-0.2	5.1-6.5	Very high-----	0.32	5	.5-2

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "frequent," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern]

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
AtA Attoyac	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
BaB*:											
Bernaldo	B	None	---	---	4.0-6.0	Apparent	Nov-Feb	>60	---	Moderate	Moderate.
Besner	B	None	---	---	4.0-6.0	Apparent	Jan-Feb	>60	---	Low	Moderate.
BeB*:											
Besner	B	None	---	---	4.0-6.0	Apparent	Jan-Feb	>60	---	Low	Moderate.
Mollville	D	None	---	---	+.5-1.0	Perched	Jan-Apr	>60	---	High	High.
BIB*:											
Bienville	A	None	---	---	4.0-6.0	Apparent	Dec-Apr	>60	---	Low	Moderate.
Alaga	A	None	---	---	>6.0	---	---	>60	---	Low	Moderate.
BOE*:											
Bonwier	C	None	---	---	>6.0	---	---	>60	---	High	High.
Stringtown	B	None	---	---	>6.0	---	---	>60	---	Moderate	High.
BrD*:											
Browndell	D	None	---	---	>6.0	---	---	14-20	Soft	High	High.
Rock outcrop.											
BuD Burkeville	D	None	---	---	0-2.0	Perched	Jan-Mar	>60	---	High	Low.
CRB*:											
Corrigan	D	None	---	---	0-3.0	Perched	Dec-Mar	20-40	Soft	High	High.
Rayburn	D	None	---	---	2.5-4.5	Perched	Dec-Feb	40-60	Soft	High	High.
De* Deweyville	D	Frequent	Very long	Jan-Dec	+3-0.5	Apparent	Jan-Dec	>60	---	High	High.
DUB*:											
Doucette	B	None	---	---	>6.0	---	---	>60	---	Moderate	High.
Boykin	B	None	---	---	>6.0	---	---	>60	---	Moderate	High.
EaA Evadale	D	None	---	---	0-1.5	Perched	Dec-Apr	>60	---	High	High.
EdA Evadale	D	None	---	---	+1-1.0	Perched	Dec-Aug	>60	---	High	High.
EgB*:											
Evadale	D	None	---	---	0-1.5	Perched	Dec-Apr	>60	---	High	High.
Gist	D	None	---	---	2.0-4.0	Perched	Nov-May	>60	---	High	High.
EvA*:											
Evadale	D	None	---	---	0-1.5	Perched	Dec-Apr	>60	---	High	High.
Vidrine	D	None	---	---	1.0-2.0	Perched	Dec-Apr	>60	---	High	Moderate.
GAB*:											
Gallime	B	None	---	---	4.0-6.0	Apparent	Dec-Mar	>60	---	Moderate	Moderate.
Spurger	C	None	---	---	2.5-3.5	Perched	Dec-Feb	>60	---	High	High.

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
Gw* Gladewater	D	Frequent	Brief to long.	Nov-May	0-3.5	Apparent	Nov-May	>60	---	High	Moderate.
Iu* Iuka	C	Frequent	Very brief to brief.	Dec-Apr	1.0-3.0	Apparent	Dec-Apr	>60	---	Moderate	High.
JaA Jasco	D	None	---	---	+.5-3.0	Perched	Sep-May	>60	---	High	High.
KJB*:											
Kirbyville	B	None	---	---	1.5-2.5	Apparent	Jan-Mar	>60	---	High	Moderate.
Jasco	D	None	---	---	+.5-3.0	Perched	Sep-May	>60	---	High	High.
KWB*:											
Kirbyville	B	None	---	---	1.5-2.5	Apparent	Jan-Mar	>60	---	High	Moderate.
Waller	B/D	None	---	---	0-2.5	Apparent	Nov-Jun	>60	---	High	Moderate.
KAE*:											
Kisatchie	D	None	---	---	>6.0	---	---	20-40	Soft	High	High.
Rayburn	D	None	---	---	2.5-4.5	Perched	Dec-Feb	40-60	Soft	High	High.
LTC*:											
Letney	A	None	---	---	>6.0	---	---	>60	---	Low	High.
Tehran	A	None	---	---	>6.0	---	---	>60	---	Low	High.
MaB Malbis	B	None	---	---	2.5-4.0	Perched	Dec-Mar	>60	---	Moderate	Moderate.
MKB*:											
Malbis	B	None	---	---	2.5-4.0	Perched	Dec-Mar	>60	---	Moderate	Moderate.
Kirbyville	B	None	---	---	1.5-2.5	Apparent	Jan-Mar	>60	---	High	Moderate.
Mn*:											
Mantachie	C	Frequent	Brief	Jan-Mar	1.0-1.5	Apparent	Dec-Mar	>60	---	High	High.
Bleakwood	C	Frequent	Long	Nov-Apr	0-1.5	Apparent	Sep-May	>60	---	High	High.
Mo* Melhomes	D	Frequent	Brief	Dec-May	0-1.0	Apparent	Jan-Dec	>60	---	High	High.
Mr* Mooreville	C	Occasional	Brief to long.	Jan-Mar	3.0-6.0	Apparent	Jan-Mar	>60	---	Moderate	High.
NEB*, NEE*:											
Newco	D	None	---	---	>6.0	---	---	>60	---	High	High.
Urland	C	None	---	---	>6.0	---	---	>60	---	High	High.
NfC Nikful	D	None	---	---	0-3.5	Perched	Nov-Mar	40-60	Soft	High	High.
NKB*:											
Niwana	B	None	---	---	4.0-6.0	Apparent	Jan-Mar	>60	---	Moderate	High.
Kirbyville	B	None	---	---	1.5-2.5	Apparent	Jan-Mar	>60	---	High	Moderate.
Oc* Ochlockonee	B	Occasional	Very brief	Dec-Apr	3.0-4.0	Apparent	Dec-Apr	>60	---	Low	High.
PIC*:											
Pinetucky	B	None	---	---	>6.0	---	---	>60	---	High	High.
Doucette	B	None	---	---	>6.0	---	---	>60	---	Moderate	High.
RAB*:											
Rayburn	D	None	---	---	2.5-4.5	Perched	Dec-Feb	40-60	Soft	High	High.

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
RAB*:											
Corrigan	D	None	---	---	0-3.0	Perched	Dec-Mar	20-40	Soft	High	High.
RBE*:											
Rayburn	D	None	---	---	2.5-4.5	Perched	Dec-Feb	40-60	Soft	High	High.
Kisatchie	D	None	---	---	>6.0	---	---	20-40	Soft	High	High.
REB*:											
Redco	D	None	---	---	0-2.0	Apparent	Oct-May	>60	---	High	Moderate.
Woodville	D	None	---	---	2.5-4.0	Apparent	Dec-Feb	>60	---	High	High.
RPB*:											
Rogan	B	None	---	---	>6.0	---	---	>60	---	Moderate	High.
Pinetucky	B	None	---	---	>6.0	---	---	>60	---	High	High.
SBC*, SBE*:											
Shankler	A	None	---	---	>6.0	---	---	>60	---	Low	High.
Boykin	B	None	---	---	>6.0	---	---	>60	---	Moderate	High.
SMB*:											
Spurger	C	None	---	---	2.5-3.5	Perched	Dec-Feb	>60	---	High	High.
Mollville	D	None	---	---	+.5-1.0	Perched	Jan-Apr	>60	---	High	High.
STE*:											
Stringtown	B	None	---	---	>6.0	---	---	>60	---	Moderate	High.
Bonwier	C	None	---	---	>6.0	---	---	>60	---	High	High.
SXC*:											
Stringtown	C	None	---	---	>6.0	---	---	>60	---	Moderate	High.
Bonwier	D	None	---	---	>6.0	---	---	>60	---	High	High.
TaB, TaD Tahoula	D	None	---	---	0-2.0	Perched	Jan-Mar	>60	---	High	Low.
TLE*:											
Tehran	A	None	---	---	>6.0	---	---	>60	---	Low	High.
Letney	A	None	---	---	>6.0	---	---	>60	---	Low	High.
Um*:											
Urbo	D	Frequent	Brief to long.	Jan-Mar	1.0-2.0	Apparent	Jan-Mar	>60	---	High	High.
Mantachie	C	Frequent	Brief	Jan-Mar	1.0-1.5	Apparent	Dec-Mar	>60	---	High	High.
UPB*:											
Urland	C	None	---	---	>6.0	---	---	>60	---	High	High.
Pinetucky	B	None	---	---	>6.0	---	---	>60	---	High	High.
WAA*:											
Waller	B/D	None	---	---	0-2.5	Apparent	Nov-Jun	>60	---	High	Moderate.
Evadale	D	None	---	---	0-1.5	Perched	Dec-Apr	>60	---	High	High.
WgC Wiergate	D	None	---	---	0-2.0	Perched	Jan-Mar	>60	---	High	Low.
WTB*:											
Woodville	D	None	---	---	2.5-4.0	Apparent	Dec-Feb	>60	---	High	High.
Redco	D	None	---	---	0-2.0	Apparent	Oct-May	>60	---	High	Moderate.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 18.--ENGINEERING TEST DATA

[Dashes indicate data were not available. NP means nonplastic]

Soil name, report number, horizon, and depth in inches	Classification		Grain size distribution[1]									Liquid limit[2]	Plasticity index[2]	Specific gravity	Shrinkage		
			Percentage passing sieve--						Percentage smaller than--								
	AASHTO	Unified	5/8 inch	3/8 inch	No. 4	No. 10	No. 40	No. 200	.05 mm	.005 mm	.002 mm				Limit	Linear	Ratio
												Pct		G/cc	Pct	Pct	Pct
Bernaldo loam:[3] (S75TX-241-002)																	
A2---------------- 3 to 8	A-4 (00)	CL-ML	100	100	100	100	98	73	70	24	12	20	4	2.64	17.0	1.5	1.7
B22t--------------15 to 28	A-6 (05)	CL	100	100	100	100	97	55	50	27	25	30	14	2.67	16.0	7.6	1.8
Besner fine sandy loam:[4] (S75TX-241-003)																	
A2---------------- 4 to 22	A-4 (00)	SM	100	100	100	100	95	38	29	8	3	14	2	2.64	13.0	1.2	1.9
B21t--------------22 to 34	A-4 (00)	SM	100	100	100	100	96	41	33	10	6	14	2	2.67	13.0	0.7	1.9
B23t--------------37 to 48	A-6 (05)	CL	100	100	100	100	97	53	48	25	20	29	17	2.64	13.0	8.6	1.9
Bienville loamy fine sand:[5] (S76TX-351-005)																	
A2---------------- 6 to 20	A-2-4(00)	SM	100	100	100	100	96	17	12	4	2	19	3	2.64	16.0	0.0	1.6
B21t&A2-----------20 to 70	A-2-4(00)	SM	100	100	100	100	96	18	13	2	2	19	3	2.62	16.0	0.0	1.6
Boykin loamy fine sand:[6] (S76TX-351-004)																	
A2---------------- 8 to 24	A-2-4(00)	SM	100	100	100	100	72	19	16	6	3	14	2	2.63	13.0	0.8	1.9
B22t--------------27 to 48	A-7-6(00)	SC	100	100	100	100	80	42	41	32	29	44	27	2.69	16.0	13.2	1.8
Corrigan fine sandy loam:[7] (S77TX-351-002)																	
A1---------------- 0 to 4	A-4 (00)	ML	100	100	100	100	98	51	38	8	5	23	3	2.59	20.0	1.7	1.6
B21tg------------- 6 to 18	A-7-6(42)	CH	100	100	100	100	100	84	81	64	62	71	46	2.65	11.0	22.7	1.9
B3&C--------------26 to 32	A-7-6(27)	CH	100	100	100	100	99	71	67	47	43	59	39	2.63	16.0	17.7	1.8
Doucette loamy fine sand:[8] (S76TX-351-003)																	
A2----------------12 to 24	A-2-4(00)	SM	100	99	99	99	86	35	28	7	4	13	2	2.64	13.0	0.0	1.9
B22t--------------38 to 54	A-6 (04)	SC	100	100	100	99	88	49	44	28	26	35	15	2.68	16.0	9.5	1.8
Evadale sandy loam:[9] (S77TX-241-004)																	
A2g--------------- 3 to 10	A-4 (01)	ML	100	100	100	100	100	97	67	15	9	21	3	2.60	18.0	1.6	1.7
B22tg&A2----------18 to 70	A-6 (20)	CL	100	100	100	100	100	98	72	31	25	35	21	2.66	16.0	9.3	1.8
Gist very fine sandy loam:[10] (S77TX-241-003)																	
A2---------------- 4 to 16	A-4 (00)	ML	100	100	100	100	99	67	50	8	7	21	3	2.63	18.0	1.7	1.7
B22t&A2-----------25 to 41	A-4 (01)	CL-ML or ML	100	100	100	99	99	71	55	16	15	22	4	2.66	18.0	2.7	1.7
B24t--------------52 to 70	A-7-6(20)	CL	100	100	100	100	100	78	68	38	38	45	27	2.66	17.0	12.7	1.8

See footnote at end of table.

TABLE 18.--ENGINEERING TEST DATA--Continued

Soil name, report number, horizon, and depth in inches	Classification		Grain size distribution[1]									Liquid limit[2]	Plasticity index[2]	Specific gravity	Shrinkage		
			Percentage passing sieve--						Percentage smaller than--								
	AASHTO	Unified	5/8 inch	3/8 inch	No. 4	No. 10	No. 40	No. 200	.05 mm	.005 mm	.002 mm				Limit	Linear	Ratio
												Pct		G/cc	Pct	Pct	Pct
Jasco sandy loam:[11] (S76TX-241-001)																	
A2g---------------- 4 to 23	A-4 (00)	ML	100	100	100	99	99	81	68	13	4	17	2	2.63	15.0	1.4	1.8
Bx----------------23 to 44	A-4 (00)	ML CL-ML	100	100	100	99	99	80	65	13	7	18	3	2.65	16.0	1.3	1.8
B2t&A'2-----------44 to 65	A-4 (05)	CL	100	100	100	99	99	80	70	22	16	27	9	2.65	18.0	4.8	1.7
Kirbyville fine sandy loam:[12] (S76TX-241-002)																	
A2---------------- 5 to 18	A-4 (00)	CL-ML or ML	100	100	99	99	98	76	56	12	10	20	4	2.64	17.0	1.7	1.8
B21t&A2---------- 18 to 35	A-6 (07)	CL	100	99	98	96	95	76	61	20	18	29	12	2.65	17.0	6.4	1.8
B23t&A2-----------56 to 75	A-7-6(18)	CL	100	99	98	98	98	77	64	25	28	41	25	2.68	18.0	11.3	1.8
Kirbyville fine sandy loam:[13] (S76TX-241-003)																	
A2---------------- 5 to 12	A-4 (00)	ML	100	100	100	100	99	77	63	12	10	20	3	2.64	16.0	2.1	1.8
B22t&A2-----------20 to 33	A-6 (11)	CL	100	98	95	94	93	74	63	27	28	34	17	2.66	17.0	8.8	1.8
Bx1&A2------------33 to 40	A-6 (11)	CL	100	97	93	90	89	69	67	23	20	36	19	2.67	16.0	9.4	1.8
Bx2&A2------------40 to 55	A-6 (06)	CL	100	97	91	90	89	67	65	20	17	30	13	2.71	19.0	6.0	1.7
Malbis fine sandy loam:[14] (S75TX-351-001)																	
A2---------------- 5 to 8	A-4 (00)	SM	100	100	98	96	92	45	35	8	5	19	3	2.62	16.0	1.6	1.8
B21t-------------- 8 to 18	A-6 (03)	CL	100	100	99	97	94	53	47	21	18	25	11	2.66	15.0	5.6	1.9
B23t--------------38 to 60	A-6 (08)	CL	100	99	95	93	90	59	51	28	23	34	18	2.68	14.0	10.2	1.9
Rayburn fine sandy loam:[15] (S77TX-351-001)																	
A1---------------- 0 to 4	A-2-4(00)	SM	100	100	100	100	83	29	25	7	4	19	3	2.59	17.0	1.5	1.8
B21t-------------- 7 to 18	A-7-6(30)	CH	100	100	100	100	96	75	73	59	58	65	38	2.68	13.0	20.9	1.9
B22t--------------18 to 32	A-7-6(47)	CH	100	100	100	100	98	85	81	66	64	77	49	2.67	14.0	23.3	1.9
B3&C--------------43 to 47	A-7-6(25)	CH	100	100	100	100	100	77	73	49	44	55	32	2.64	14.0	17.5	1.8
Tehran loamy sand:[16] (S76TX-351-002)																	
A21---------------13 to 36	A-2-4(00)	SM	100	100	100	100	76	18	14	5	2	14	2	2.63	14.0	0.0	1.7
B21t--------------51 to 62	A-2-4(00)	SM-SC or SC	100	100	100	99	76	24	23	17	13	21	7	2.65	15.0	3.0	1.8
Waller very fine sandy loam:[17] (S77TX-241-002)																	
A2g--------------- 6 to 16	A-4 (00)	ML	100	100	100	100	100	62	53	19	12	20	3	2.62	17.0	2.3	1.7
B21tg&A2----------16 to 31	A-4 (00)	CL-ML	100	100	100	100	100	63	49	22	15	20	4	2.62	16.0	2.7	1.8
B23tg&A2----------36 to 55	A-6 (08)	CL	100	100	100	100	100	70	60	34	26	29	15	2.63	15.0	7.2	1.8

See footnote at end of table.

TABLE 18.--ENGINEERING TEST DATA--Continued

Soil name, report number, horizon, and depth in inches	Classification		Grain size distribution[1]									Liquid limit[2]	Plasticity index[2]	Specific gravity	Shrinkage		
			Percentage passing sieve--						Percentage smaller than--								
	AASHTO	Unified	5/8 inch	3/8 inch	No. 4	No. 10	No. 40	No. 200	.05 mm	.005 mm	.002 mm				Limit	Linear	Ratio
												Pct		G/cc	Pct	Pct	Pct
Wiergate clay:[18] (S77TX-241-001)																	
A1---------------- 0 to 21	A-7-6(42)	CH	100	100	100	100	100	87	85	63	58	68	44	2.68	9.0	23.3	2.0
AC2---------------27 to 50	A-7-6(60)	CH	100	99	99	97	95	93	91	77	72	81	57	2.80	10.0	25.8	2.0

[1] For soil materials larger than 3/8 inch, square mesh wire sieves were used that are slightly larger than equivalent round sieves, but these differences do not seriously affect the data.

[2] Liquid limit and plastic index values were determined by the AASHTO-89 and AASHTO-90 methods except that soil was added to water.

[3] Bernaldo loam:
From Magnolia Springs, northwest and north 4.0 miles along a county road to a junction, 100 feet west and 120 feet north, in forest.

[4] Besner fine sandy loam:
From Magnolia Springs, northwest and north 4.0 miles along a county road to a junction, 100 feet west and 115 feet north, on a mound.

[5] Bienville loamy fine sand:
From Texas Highway 87, 2 miles southwest on Farm Road 2829, 2.6 miles south on a county road, 0.6 mile northeast on a forest road, and 50 feet west.

[6] Boykin loamy fine sand:
0.7 mile from U.S. Highway 190 northeast on Texas Highway 87, 0.5 mile north to a fork in the road, 0.4 mile west on a county road, and 150 feet north.

[7] Corrigan fine sandy loam:
7.9 miles north on Texas Highway 87 from Burkeville, 6.5 miles west, 2.9 miles north, and 120 feet east.

[8] Doucette loamy fine sand:
From Newton, 4.1 miles northeast on Texas Highway 87, 1.2 miles east on Farm Road 1414, 8 miles southeast on a forest road, and 800 feet east on a trail.

[9] Evadale sandy loam:
From the junction of Highway 96 and Farm Road 2246 at Evadale, 1.0 mile east on Farm Road 2246, 1.7 miles northeast on a county road, and 220 feet north.

[10] Gist very fine sandy loam:
From junction of Highway 96 and Farm Road 2246 at Evadale, 1.0 mile east on Farm Road 2246, 1.7 miles northeast on a county road, and 180 feet north.

[11] Jasco sandy loam:
From Call Junction, 2.3 miles west on Farm Road 1004 to a forest road, 0.3 mile northwest on a forest road, and 180 feet west.

[12] Kirbyville fine sandy loam:
From Call Junction, 1.6 miles west on Farm Road 1004 to a forest road, 0.8 mile south and west on a forest road, 300 feet east, and 150 feet north.

[13] Kirbyville fine sandy loam:
From Buna, 0.2 mile north on U.S. Highway 96, 1 mile east, 0.4 mile north on a county road, 0.15 mile east on a trail, and 60 feet north, in forest.

[14] Malbis fine sandy loam:
This is not the typical pedon. It is a taxadjunct to the Malbis series because it has base saturation higher than the 20 percent upper limit for the Malbis series. From the junction of Highway 190 and Farm Road 363, 3.3 miles west on Farm Road 363, 0.4 mile southwest on a county road, and 100 feet south in forest.

[15] Rayburn fine sandy loam:
7.9 miles north on Texas Highway 87 from Burkeville, 6.5 miles west, 1.8 miles north, 0.6 mile east and north to an airstrip, 0.4 mile north, and 200 feet south.

[16] Tehran loamy sand:
10.2 miles from Burkeville north along Farm Road 692, 1.8 miles northwest on a forest road, 0.7 mile northeast on a forest trail, and 100 feet south.

[17] Waller very fine sandy loam:
From Highway 96, 0.8 mile east on Farm Road 2246, north and east 1.3 miles on a county road, and 100 feet south, in forest.

[18] Wiergate clay:
1.6 miles south on U.S. Highway 96, 0.4 mile east on a private road, 900 feet southwest, and 50 feet south, in forest.

TABLE 19.--CLASSIFICATION OF THE SOILS

[An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series]

Soil name	Family or higher taxonomic class
Alaga	Thermic, coated Typic Quartzipsamments
Attoyac	Fine-loamy, siliceous, thermic Typic Paleudalfs
Bernaldo	Fine-loamy, siliceous, thermic Glossic Paleudalfs
Besner	Coarse-loamy, siliceous, thermic Glossic Paleudalfs
Bienville	Sandy, siliceous, thermic Psammentic Paleudalfs
Bleakwood	Fine-loamy, siliceous, acid, thermic Typic Fluvaquents
Bonwier	Clayey, mixed, thermic Typic Hapludults
Boykin	Loamy, siliceous, thermic Arenic Paleudults
Browndell	Clayey, montmorillonitic, thermic, shallow Albaquic Hapludalfs
Burkeville	Very-fine, montmorillonitic, thermic Aquentic Chromuderts
Corrigan	Fine, montmorillonitic, thermic Typic Albaqualfs
Deweyville	Dysic, thermic Typic Medihemists
Doucette	Loamy, siliceous, thermic Arenic Plinthic Paleudults
Evadale	Fine, mixed, thermic Typic Glossaqualfs
Gallime	Fine-loamy, siliceous, thermic Glossic Paleudalfs
Gist	Coarse-silty, siliceous, thermic Aquic Glossudalfs
Gladewater	Fine, montmorillonitic, nonacid, thermic Vertic Haplaquepts
Iuka	Coarse-loamy, siliceous, acid, thermic Aquic Udifluvents
Jasco	Coarse-silty, siliceous, thermic Typic Fragiaqualfs
Kirbyville	Fine-loamy, siliceous, thermic Plinthaquic Paleudults
Kisatchie	Fine, montmorillonitic, thermic Typic Hapludalfs
Letney	Loamy, siliceous, thermic Arenic Paleudults
Malbis	Fine-loamy, siliceous, thermic Plinthic Paleudults
Mantachie	Fine-loamy, siliceous, acid, thermic Aeric Fluvaquents
Melhomes	Siliceous, thermic Humaqueptic Psammaquents
Mollville	Fine-loamy, mixed, thermic Typic Glossaqualfs
Mooreville	Fine-loamy, siliceous, thermic Fluvaquentic Dystrochrepts
Newco	Clayey, mixed, thermic Aquic Hapludults
Nikful	Fine, montmorillonitic, thermic Aquultic Hapludalfs
Niwana	Coarse-loamy, siliceous, thermic Typic Paleudults
Ochlockonee	Coarse-loamy, siliceous, acid, thermic Typic Udifluvents
Pinetucky	Fine-loamy, siliceous, thermic Plinthic Paleudults
Rayburn	Fine, montmorillonitic, thermic Vertic Hapludalfs
*Redco	Very-fine, montmorillonitic, thermic Aquentic Chromuderts
Rogan	Fine-loamy, siliceous, thermic Plinthic Paleudults
Shankler	Loamy, siliceous, thermic Grossarenic Paleudults
Spurger	Fine, mixed, thermic Albaquultic Hapludalfs
Stringtown	Fine-loamy, siliceous, thermic Typic Hapludults
Tahoula	Very-fine, montmorillonitic, thermic Entic Chromuderts
Tehran	Loamy, siliceous, thermic Grossarenic Paleudults
Urbo	Fine, mixed, acid, thermic Aeric Haplaquepts
Urland	Clayey, mixed, thermic Typic Hapludults
*Vidrine	Coarse-silty over clayey, mixed, thermic Glossaquic Hapludalfs
Waller	Fine-loamy, siliceous, thermic Typic Glossaqualfs
Wiergate	Very-fine, montmorillonitic, thermic Typic Pelluderts
Woodville	Fine, montmorillonitic, thermic Vertic Paleudalfs

TABLE 20.--GEOLOGY OF THE SURVEY AREA BY GENERAL SOIL MAP UNITS

General Soil Map Unit	Position	Geologic Unit	Age
Urbo-Mantachie and Iuka-Mantachie	Bottom land	Holocene alluvium	Holocene
Bienville-Alaga and parts of Besner-Bernaldo	Terrace	Deweyville Formation	Late Pleistocene
Evadale-Gist, parts of Kirbyville-Malbis, and parts of Besner-Bernaldo	Upland and terrace	Beaumont Formation	Pleistocene
Kirbyville-Malbis, parts of Malbis, and parts of Besner-Bernaldo	Upland and terrace	Montgomery Formation	Pleistocene
Most of Malbis, parts of Pinetucky-Shankler-Doucette, and parts of Besner-Bernaldo	Upland and terrace	Bentley Formation	Pleistocene
Most of Pinetucky-Shankler-Doucette and most of Tehran-Letney	Upland	Willis Formation	Plio-Pleistocene
Woodville-Redco	Upland	Fleming Formation	Miocene
Parts of Rayburn-Tehran-Kisatchie and parts of Tehran-Letney	Upland	Catahoula Formation	Late Oligocene to early Miocene
Parts of Rayburn-Tehran-Kisatchie and parts of Tehran-Letney	Upland	Whitsett and Nash Creek Formations	Late Eocene

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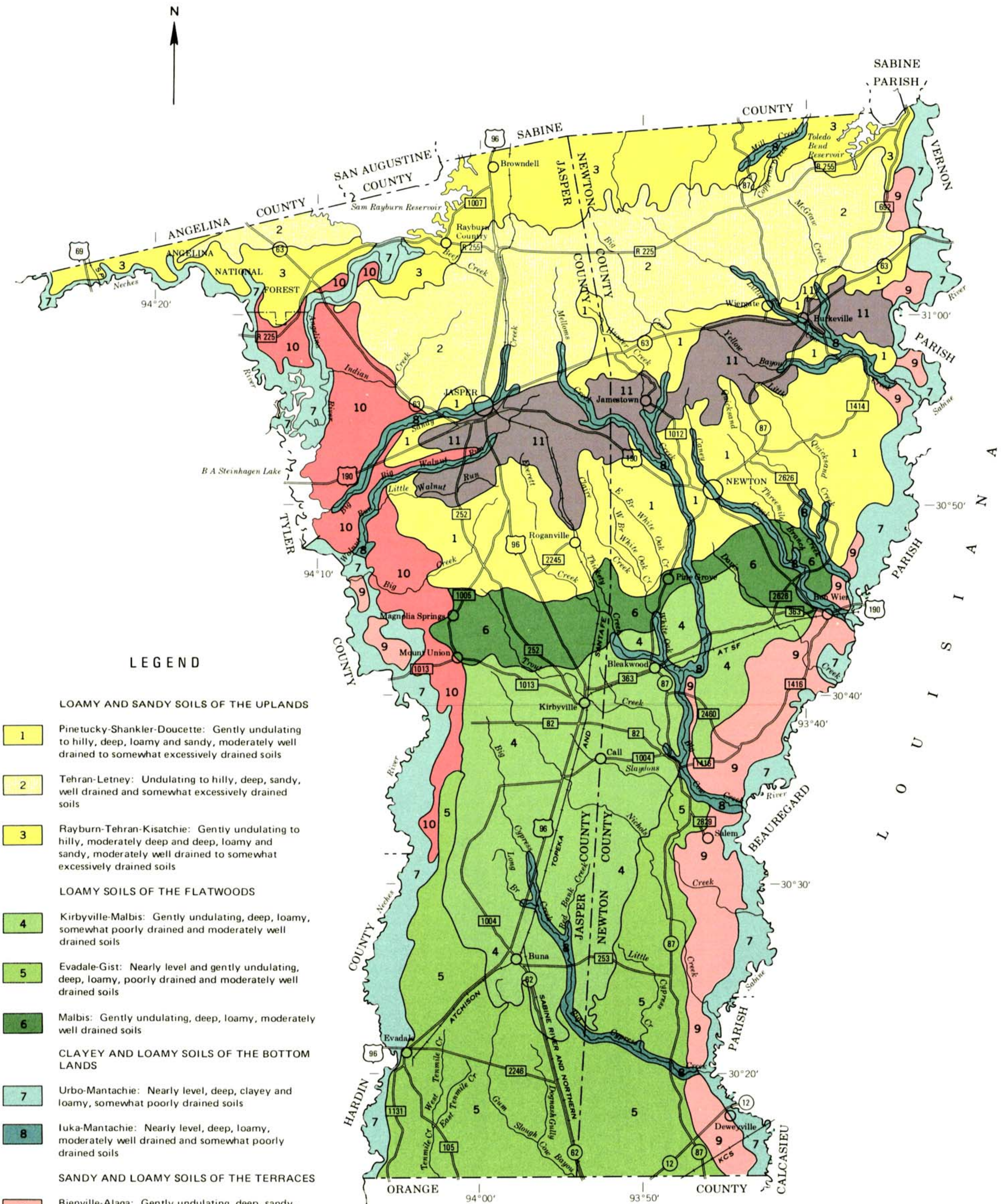


LEGEND

LOAMY AND SANDY SOILS OF THE UPLANDS

1	Pinetucky-Shankler-Doucette: Gently undulating to hilly, deep, loamy and sandy, moderately well drained to somewhat excessively drained soils
2	Tehran-Letney: Undulating to hilly, deep, sandy, well drained and somewhat excessively drained soils
3	Rayburn-Tehran-Kisatchie: Gently undulating to hilly, moderately deep and deep, loamy and sandy, moderately well drained to somewhat excessively drained soils

LOAMY SOILS OF THE FLATWOODS

4	Kirbyville-Malbis: Gently undulating, deep, loamy, somewhat poorly drained and moderately well drained soils
5	Evadale-Gist: Nearly level and gently undulating, deep, loamy, poorly drained and moderately well drained soils
6	Malbis: Gently undulating, deep, loamy, moderately well drained soils

CLAYEY AND LOAMY SOILS OF THE BOTTOM LANDS

7	Urbo-Mantachie: Nearly level, deep, clayey and loamy, somewhat poorly drained soils
8	Iuka-Mantachie: Nearly level, deep, loamy, moderately well drained and somewhat poorly drained soils

SANDY AND LOAMY SOILS OF THE TERRACES

9	Bienville-Alaga: Gently undulating, deep, sandy, somewhat excessively drained soils
10	Besner-Bernaldo: Gently undulating, deep, loamy, well drained soils

LOAMY AND CLAYEY SOILS OF THE UPLANDS

11	Woodville-Redco: Gently undulating, deep, loamy and clayey, somewhat poorly drained and poorly drained soils

* The texture terms in the descriptive headings refer to the surface layer of the major soils in the map units.

Compiled 1981

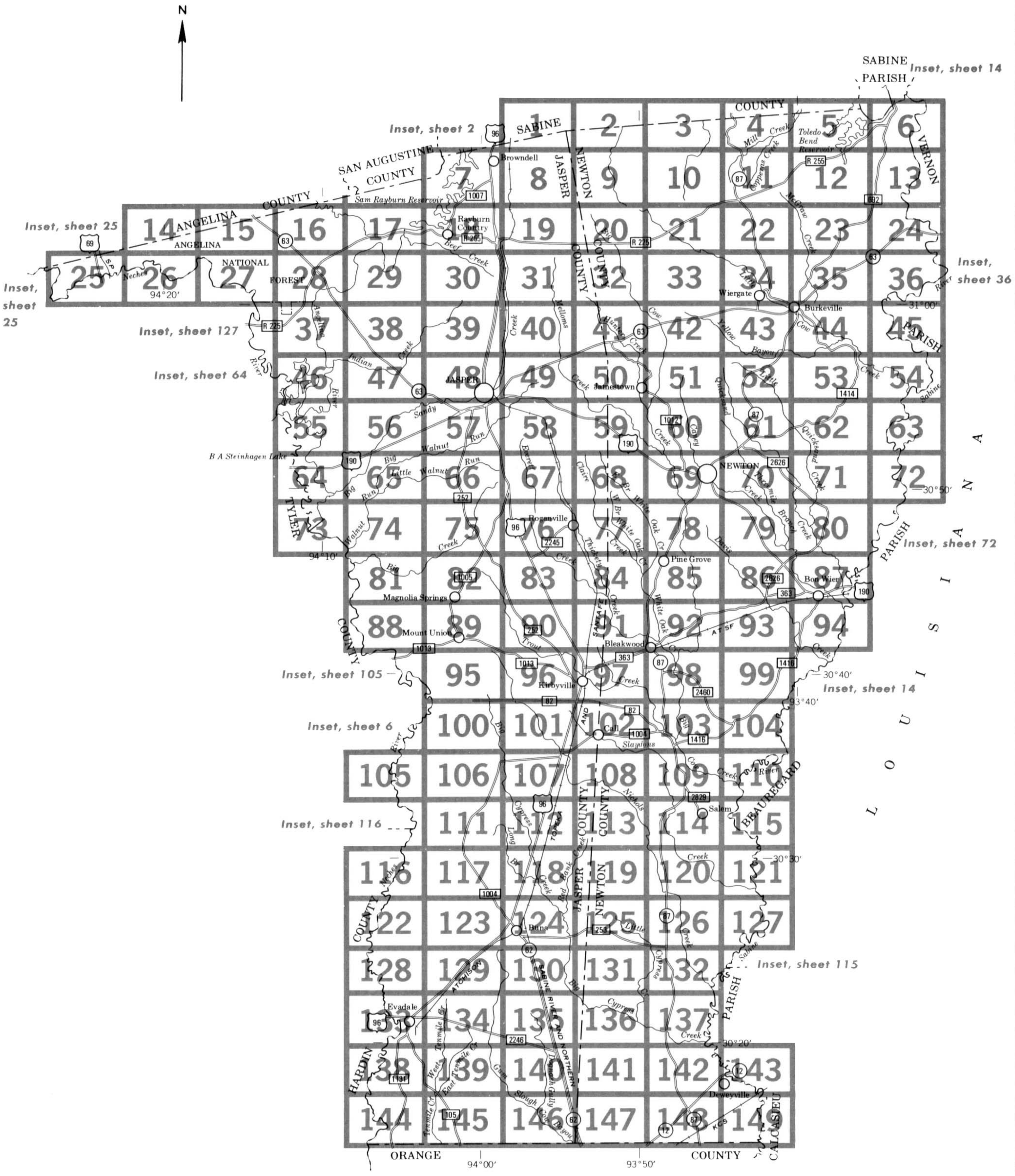
Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FOREST SERVICE
TEXAS AGRICULTURAL EXPERIMENT STATION

GENERAL SOIL MAP

JASPER AND NEWTON COUNTIES, TEXAS

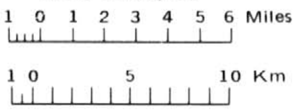
Scale 1:380,160
1 0 1 2 3 4 5 6 Miles
1 0 5 10 Km



INDEX TO MAP SHEETS

JASPER AND NEWTON COUNTIES, TEXAS

Scale 1:380,160



SOIL LEGEND

The soil legend is alphabetical. The first letter of the map symbol, always a capital, is the initial letter of the soil name. The second letter is a capital, if the mapping unit is at a lower intensity (order 3); otherwise, it is a small letter. The third letter, if used, is a capital letter and connotes slope class. Symbols without a slope letter are for level soils or miscellaneous areas. Most of the mapping units were mapped at a lower intensity (order 3) than common for the state.

SYMBOL	NAME
AtA	Attoyac fine sandy loam, 0 to 3 percent slopes
BaB	Bernaldo-Besner complex, gently undulating
BeB	Besner-Mollville complex, gently undulating
BIB	Bienville-Alaga association, gently undulating
BOE	Bonwier-Stringtown association, hilly
BrD	Browndell-Rock outcrop complex, sloping
BuD	Burkeville clay, 3 to 12 percent slopes
CRB	Corrigan-Rayburn association, gently undulating
De	Deweyville soils, frequently flooded
DUB	Doucette-Boykin association, undulating
EaA	Evadale silt loam, 0 to 1 percent slopes
EdA	Evadale silty clay loam, ponded
EgB	Evadale-Gist complex, gently undulating
EvA	Evadale-Vidrine complex, nearly level
GAB	Gallime-Spurger association, gently undulating
Gw	Gladewater soils, frequently flooded
Iu	Iuka soils, frequently flooded
JaA	Jasco silt loam, 0 to 1 percent slopes
KJB	Kirbyville-Jasco association, gently undulating
KWB	Kirbyville-Waller association, gently undulating
KAE	Kisatchie-Rayburn association, hilly
LTC	Letney-Tehran association, undulating
MaB	Malbis fine sandy loam, 1 to 5 percent slopes
MKB	Malbis-Kirbyville association, gently undulating
Mn	Mantachie and Bleakwood soils, frequently flooded
Mo	Melhomes soils, frequently flooded
Mr	Mooreville soils, occasionally flooded
NEB	Newco-Urland association, gently undulating
NEE	Newco-Urland association, hilly
NfC	Nikful fine sandy loam, 0 to 8 percent slopes
NKB	Niwana-Kirbyville association, gently undulating
Oc	Ochlockonee soils, occasionally flooded
PIC	Pinetucky-Doucette association, undulating
RAB	Rayburn-Corrigan association, undulating
RBE	Rayburn-Kisatchie association, hilly
REB	Redco-Woodville association, gently undulating
RPB	Rogan-Pinetucky association, gently undulating
SBC	Shankler-Boykin association, undulating
SBE	Shankler-Boykin association, hilly
SMB	Spurger-Mollville association, gently undulating
STE	Stringtown-Bonwier association, hilly
SXC	Stringtown-Bonwier association, graded
TaB	Tahoula clay, 1 to 5 percent slopes
TaD	Tahoula clay, 5 to 15 percent slopes
TLE	Tehran-Letney association, hilly
Um	Urbo and Mantachie soils, frequently flooded
UPB	Urland-Pinetucky association, undulating
WAA	Waller-Evadale association, nearly level
WgC	Wiergate clay, 1 to 8 percent slopes
WTB	Woodville-Redco association, gently undulating

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- National, state or province
- County or parish
- Minor civil division
- Reservation (national forest or park, state forest or park, and large airport)
- Land grant
- Limit of soil survey (label)
- Field sheet matchline & neatline

AD HOC BOUNDARY (label) — Hedley Airstrip

- Small airport, airfield, park, oilfield, cemetery, or flood pool — FLOOD POOL LINE

STATE COORDINATE TICK

LAND DIVISION CORNERS (sections and land grants)

ROADS

- Divided (median shown if scale permits)
- Other roads
- Trail

ROAD EMBLEM & DESIGNATIONS

- Interstate — 21
- Federal — 173
- State — 28
- County, farm or ranch — 1283

RAILROAD

POWER TRANSMISSION LINE (normally not shown)

PIPE LINE (normally not shown)

FENCE (normally not shown)

LEVEES

- Without road
- With road
- With railroad

DAMS

- Large (to scale)
- Medium or small — water, w

PITS

- Gravel pit
- Mine or quarry

MISCELLANEOUS CULTURAL FEATURES

- Farmstead, house (omit in urban areas)
- Church
- School
- Indian mound (label) — Indian Mound
- Located object (label) — Tower
- Tank (label) — Gas
- Wells, oil or gas
- Windmill
- Kitchen midden

WATER FEATURES

DRAINAGE

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end
- Canals or ditches
  - Double-line (label) — CANAL
  - Drainage and/or irrigation

LAKES, PONDS AND RESERVOIRS

- Perennial — water, w
- Intermittent — int, i

MISCELLANEOUS WATER FEATURES

- Marsh or swamp
- Spring
- Well, artesian
- Well, irrigation
- Wet spot

SPECIAL SYMBOLS FOR SOIL SURVEY

SOIL DELINEATIONS AND SYMBOLS — BaB, BeB

ESCARPMENTS

- Bedrock (points down slope)
- Other than bedrock (points down slope)

SHORT STEEP SLOPE

GULLY

DEPRESSION OR SINK

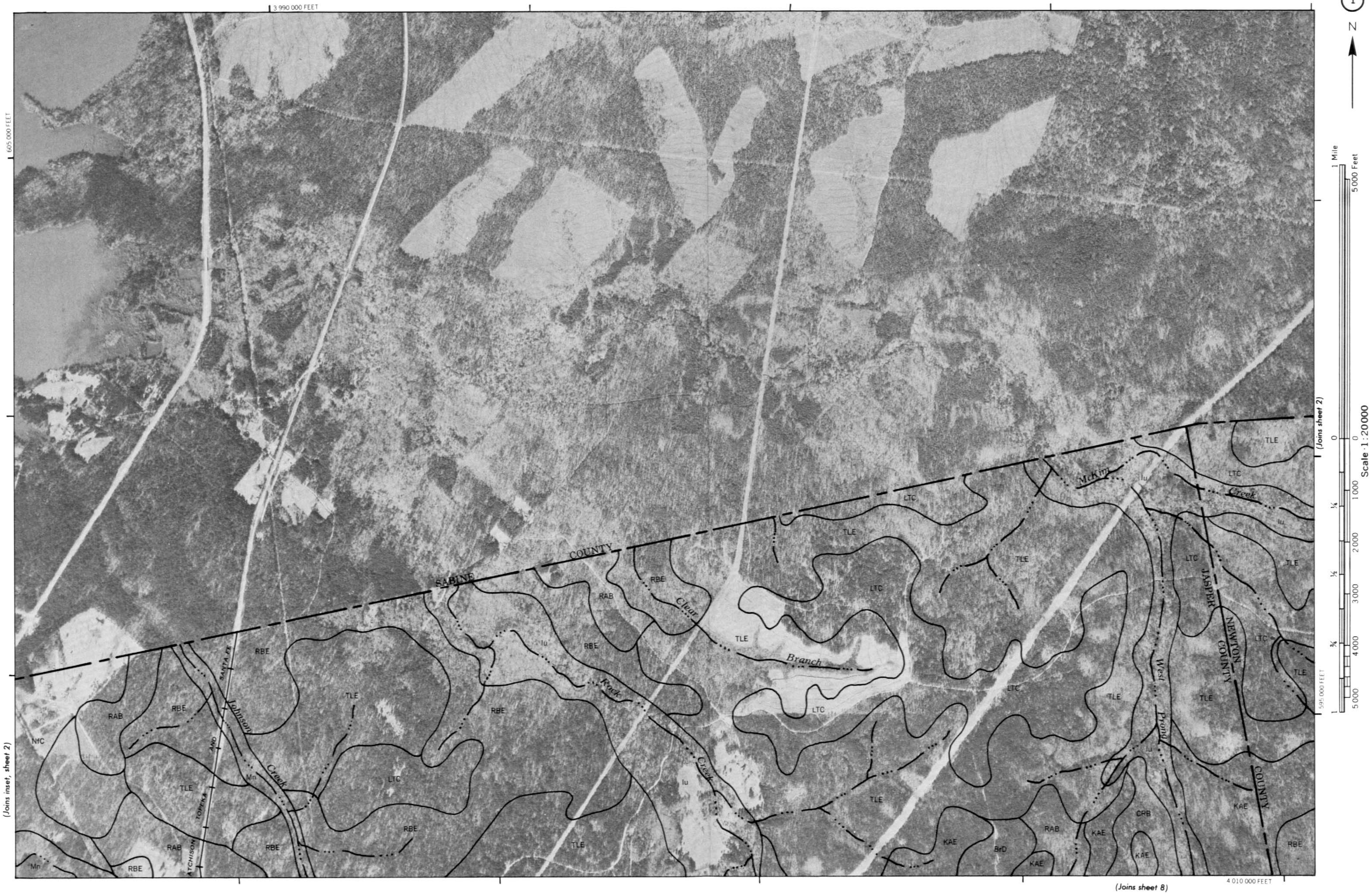
SOIL SAMPLE SITE (normally not shown) — S

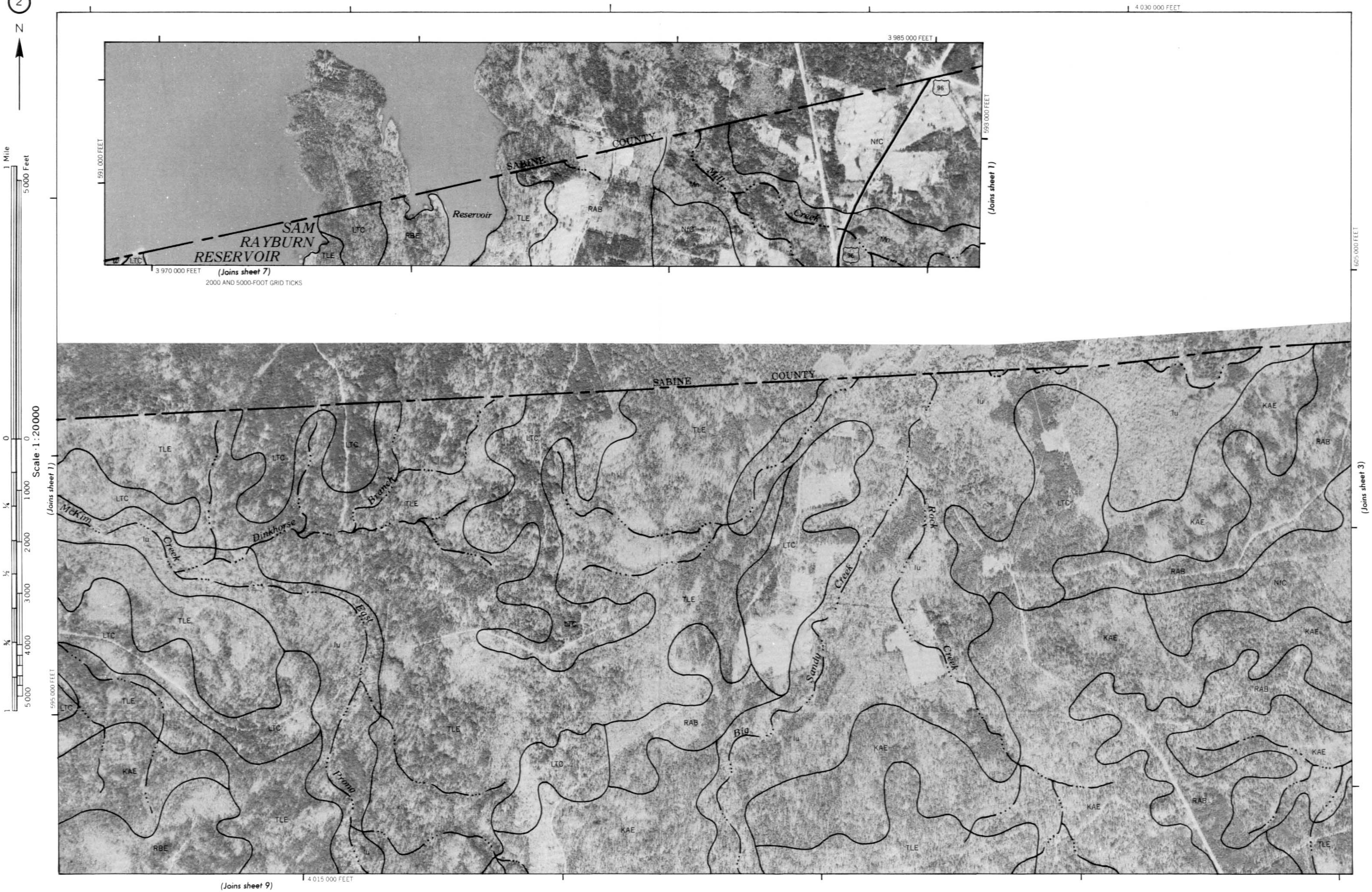
MISCELLANEOUS

- Blowout
- Clay spot
- Gravelly spot
- Gumbo, slick or scabby spot (sodic)
- Dumps and other similar non soil areas
- Prominent hill or peak
- Rock outcrop (includes sandstone and shale)
- Saline spot
- Sandy spot
- Severely eroded spot
- Slide or slip (tips point upslope)
- Stony spot, very stony spot

JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 1

①

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3 970 000 FEET
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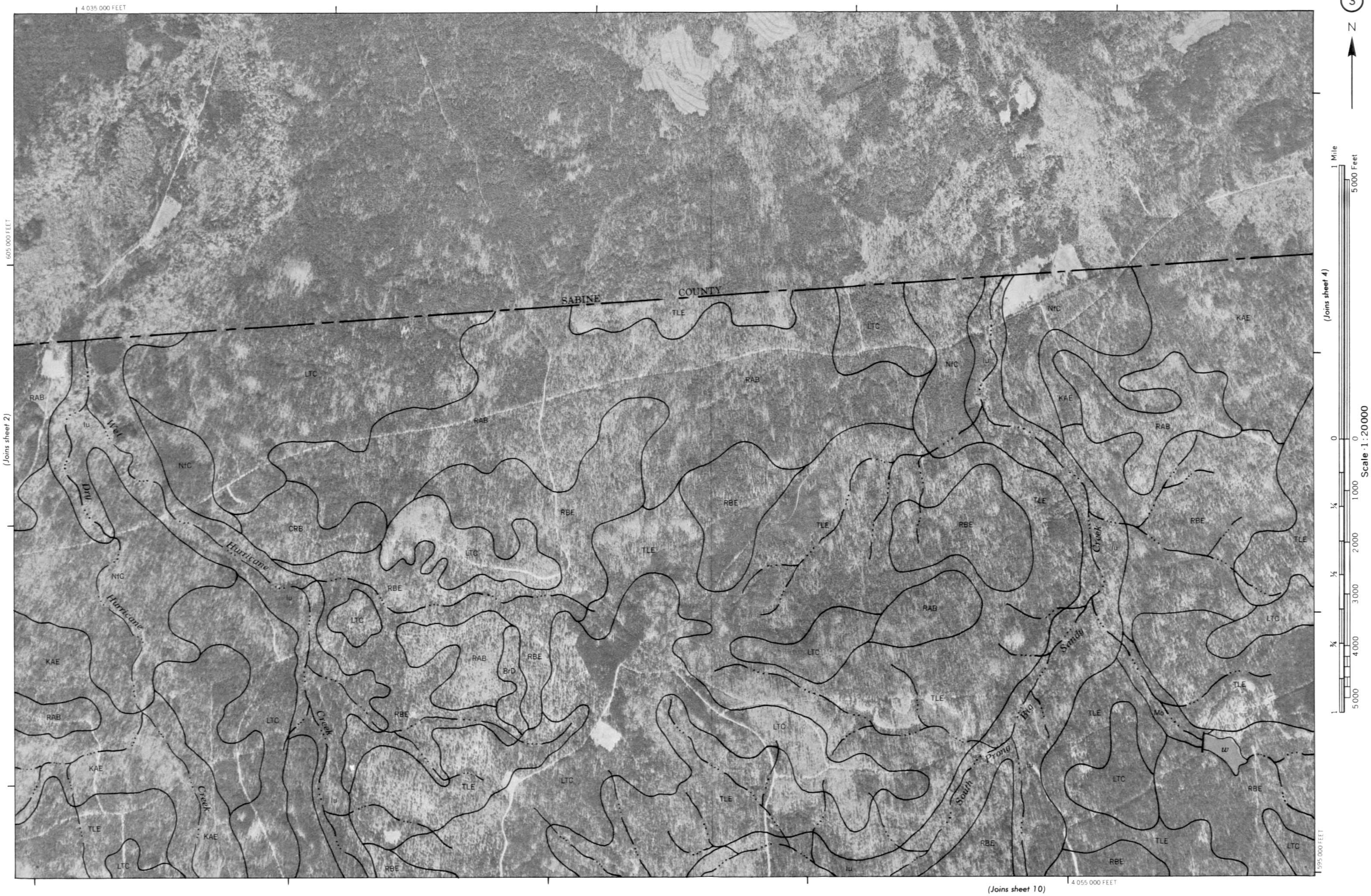
(Joins sheet 1)
(Joins sheet 3)
(Joins sheet 9)
2000 AND 5000-FOOT GRID TICKS
SAM RAYBURN RESERVOIR
Reservoir
SABINE COUNTY
96
Mill Creek
NfC
Mn
RAB
TLE
LTC
RBE
McKim Creek
Dinkhorse Branch
East Prong
Big Sandy Creek
Rock Creek
Iu
KAE

JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 3



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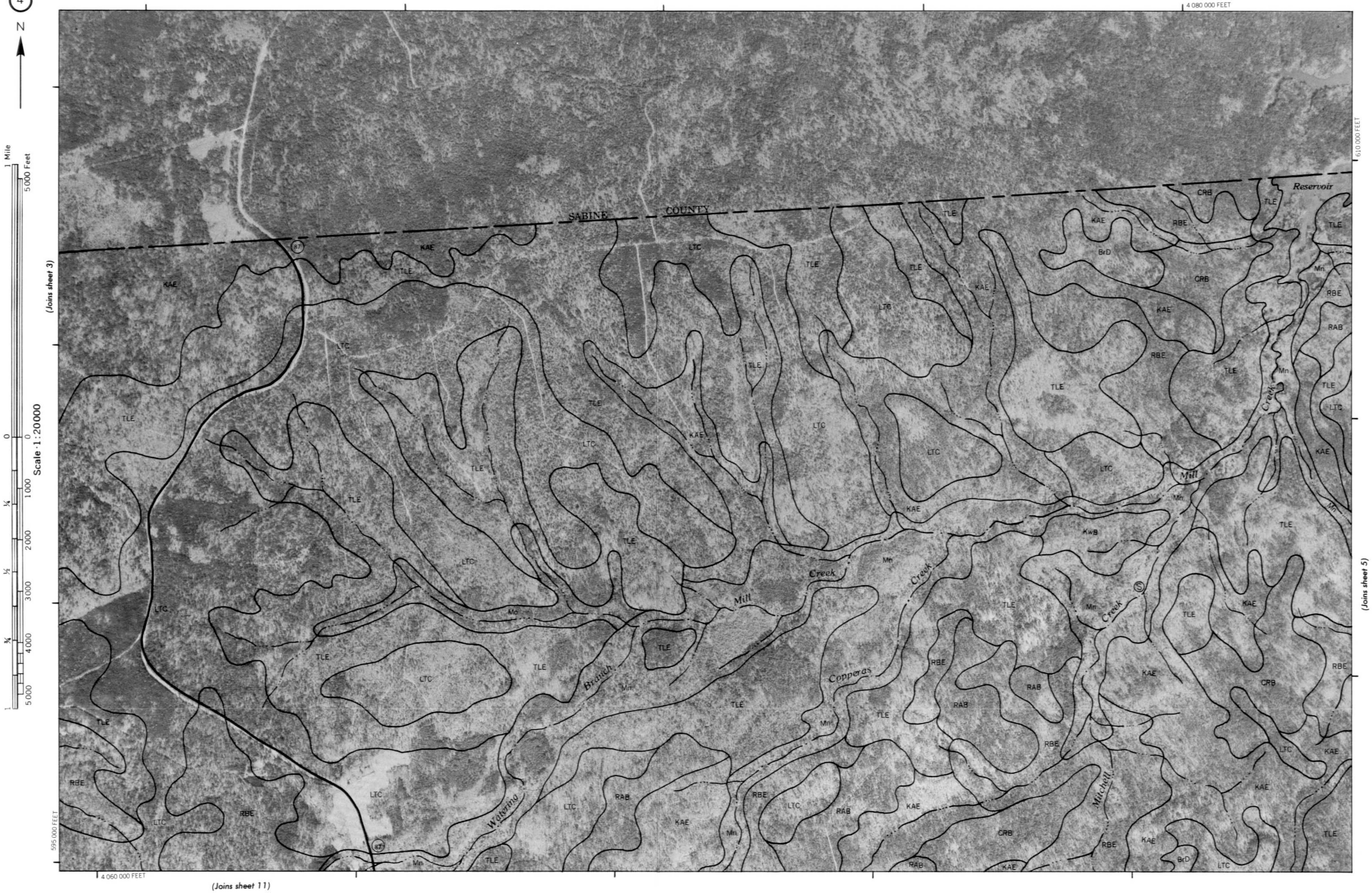

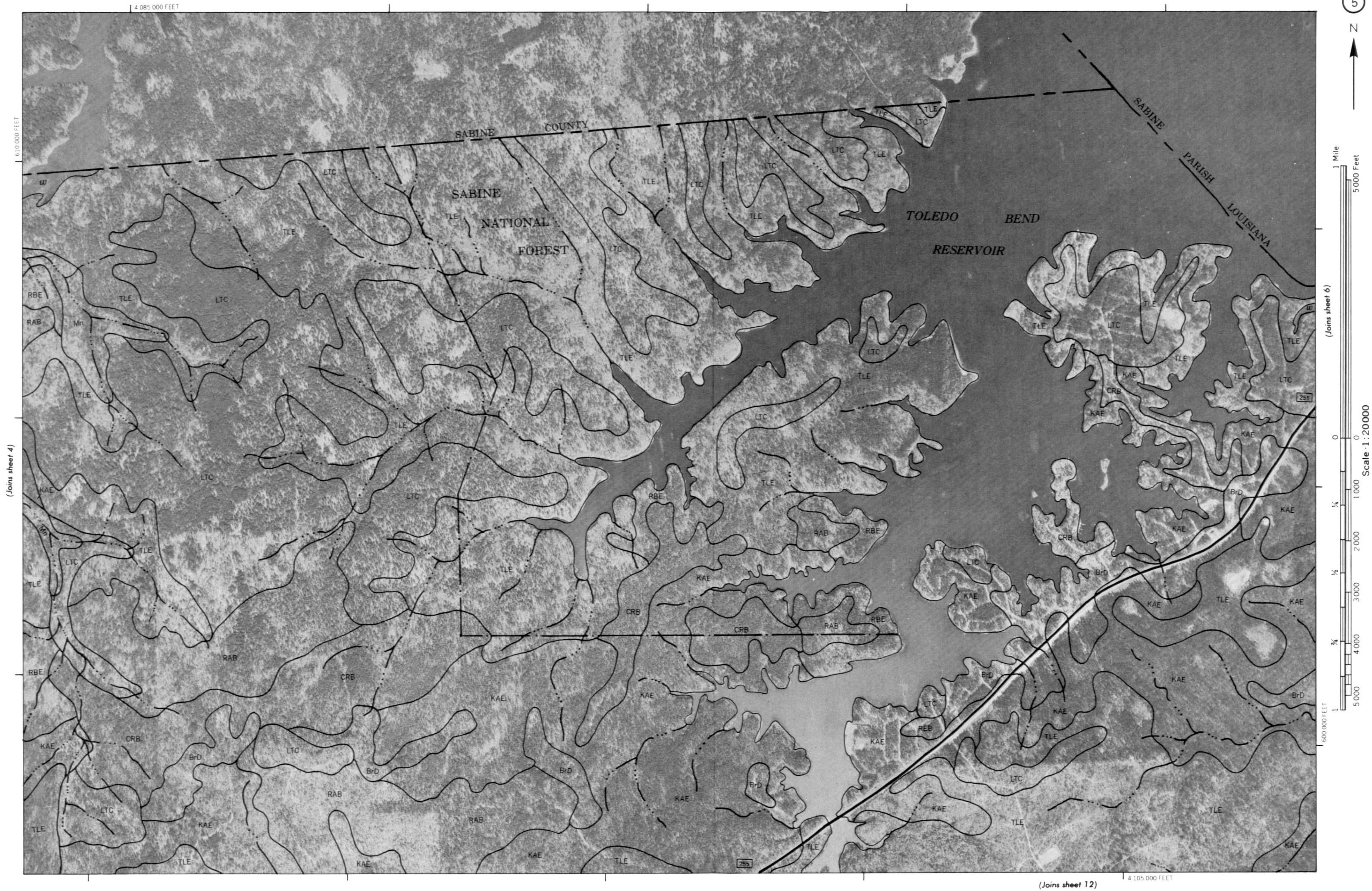
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SABINE NATIONAL FOREST
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(Joins sheet 12)
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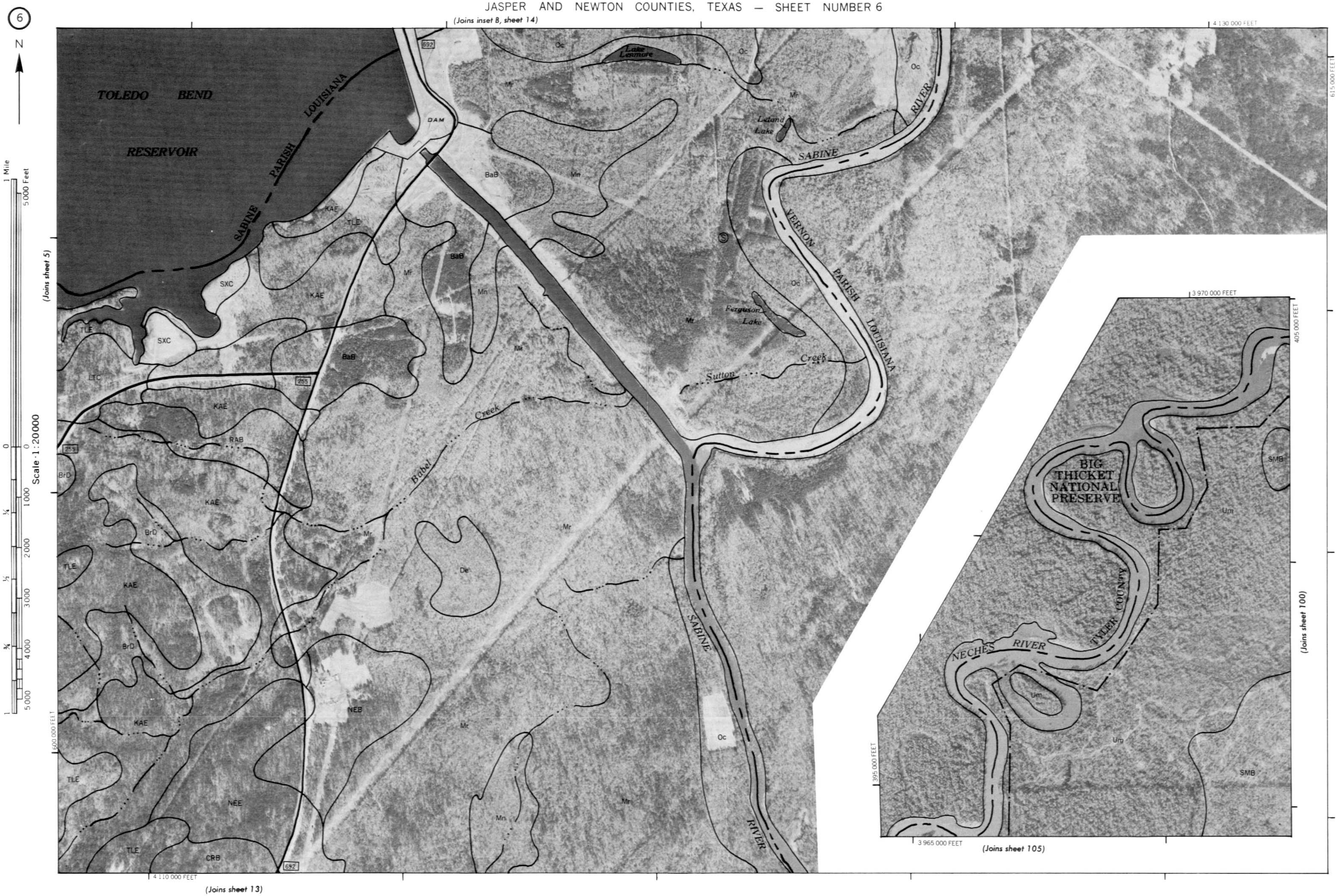

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Lake Leemore
Leland Lake
Ferguson Lake
Sutton Creek
Babel Creek
SABINE RIVER
VERNON PARISH LOUISIANA
SABINE RIVER
Oc
Mr
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BaB
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TLE
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3 970 000 FEET
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BIG THICKET NATIONAL PRESERVE
NECHES RIVER
TYLER COUNTY
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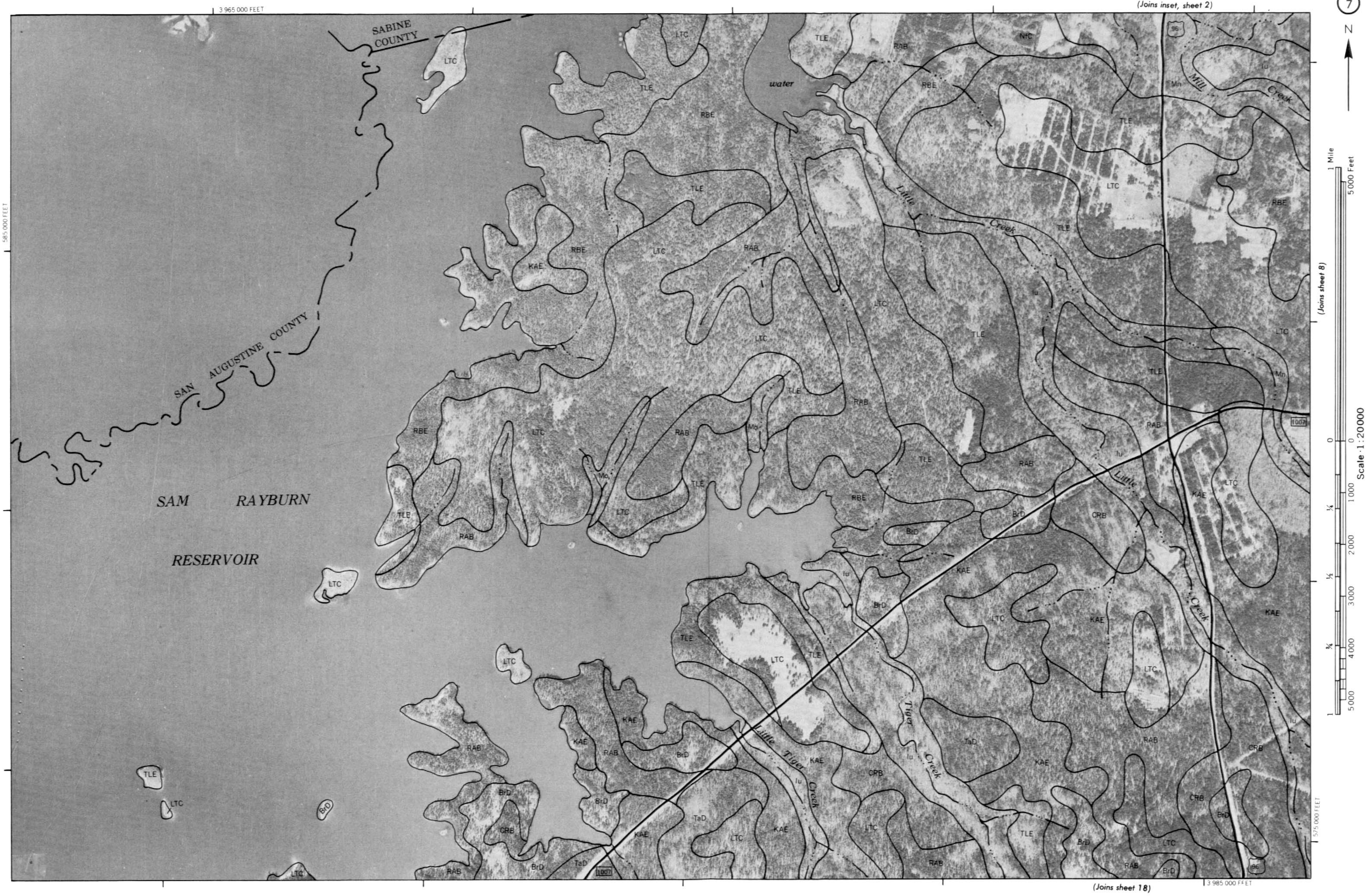
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 7



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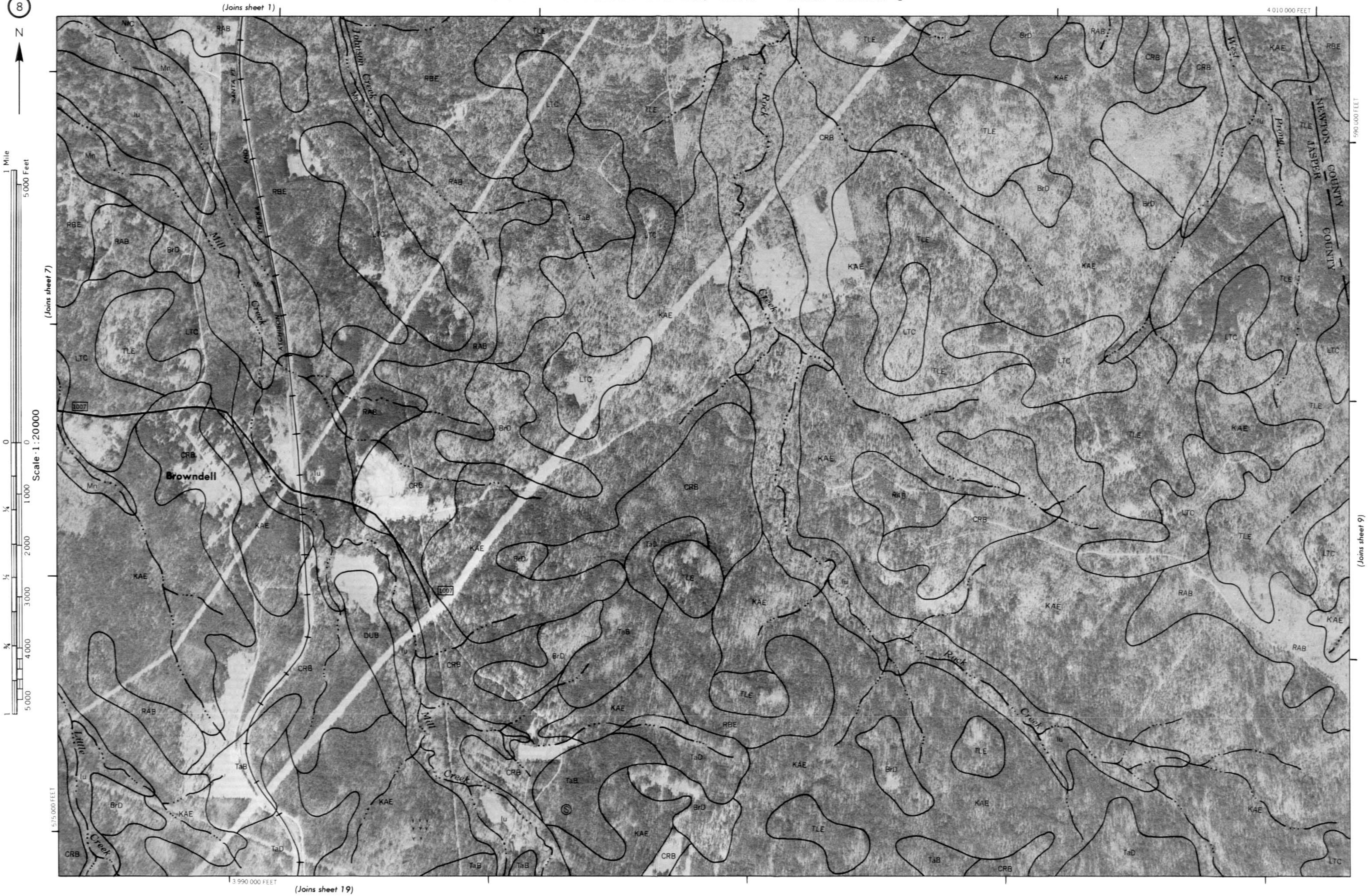

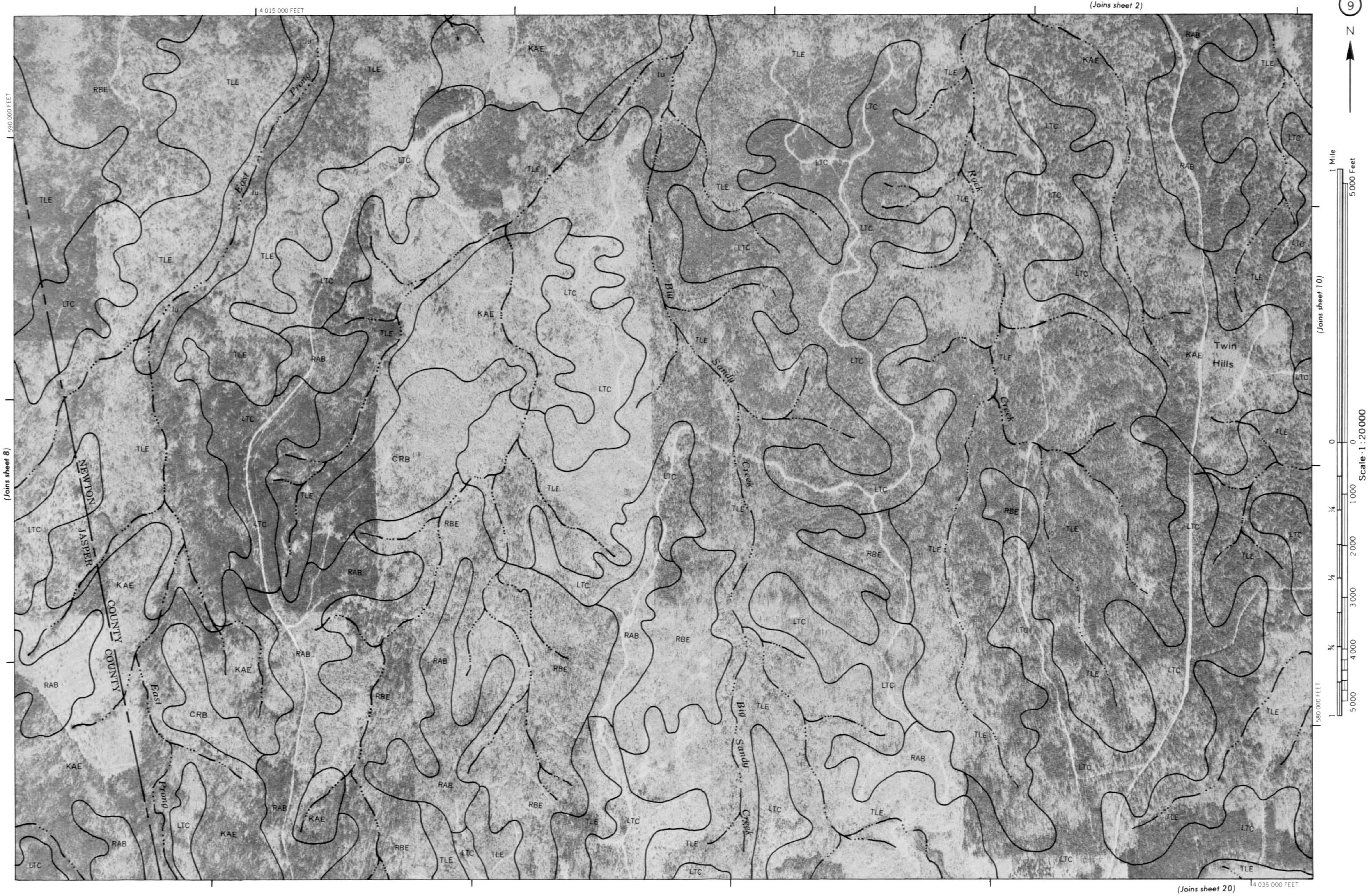
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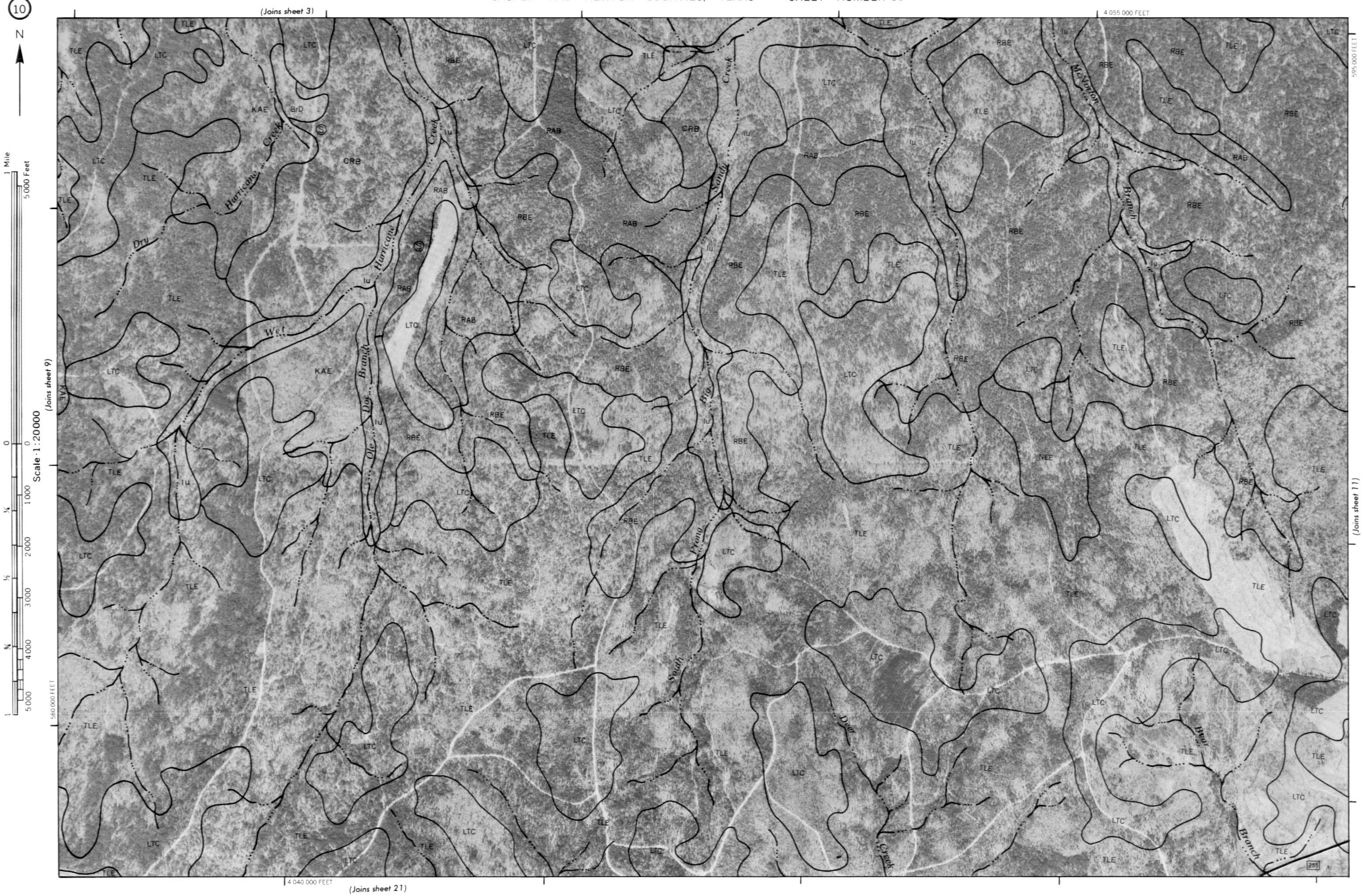
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 10



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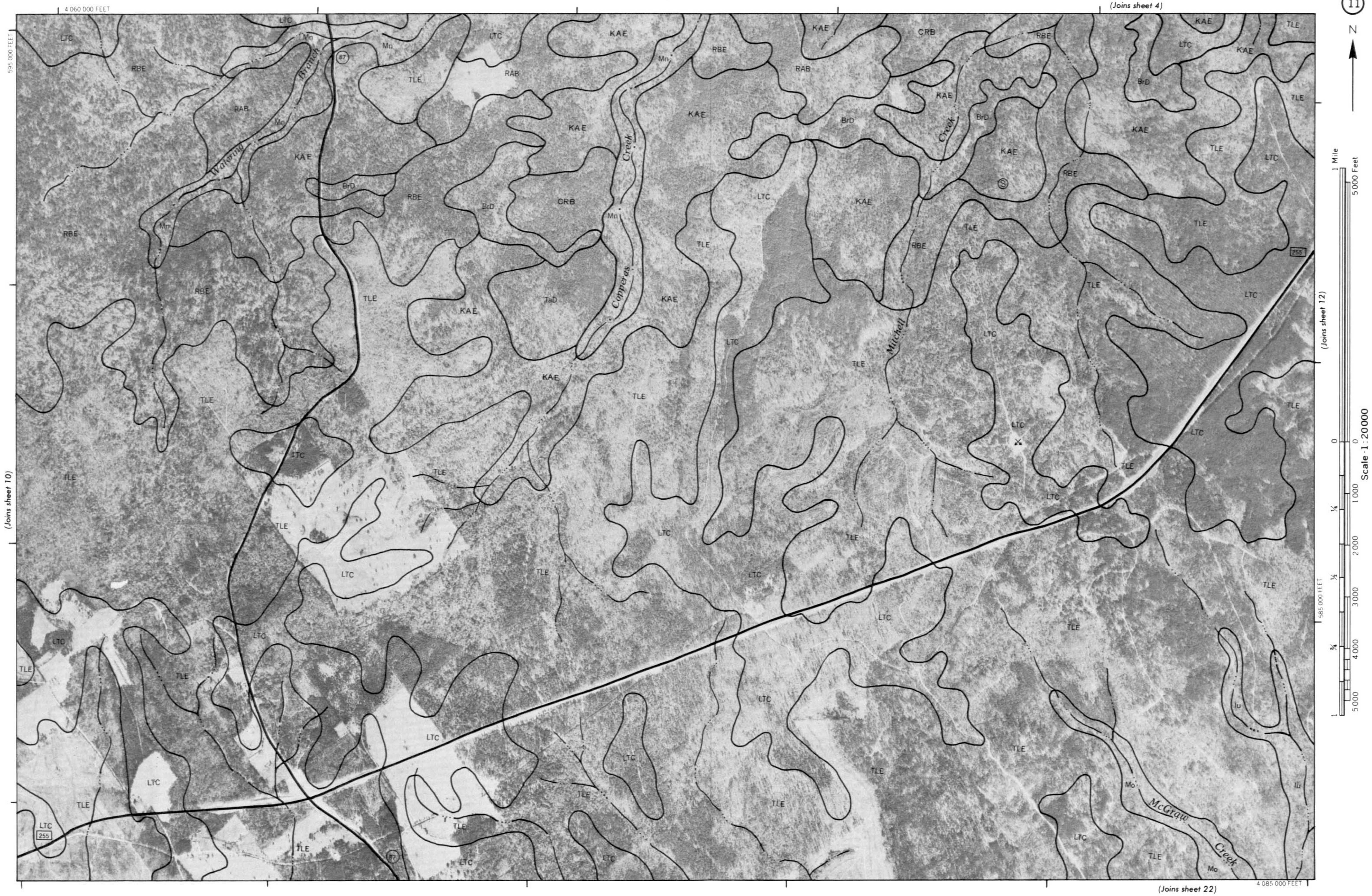

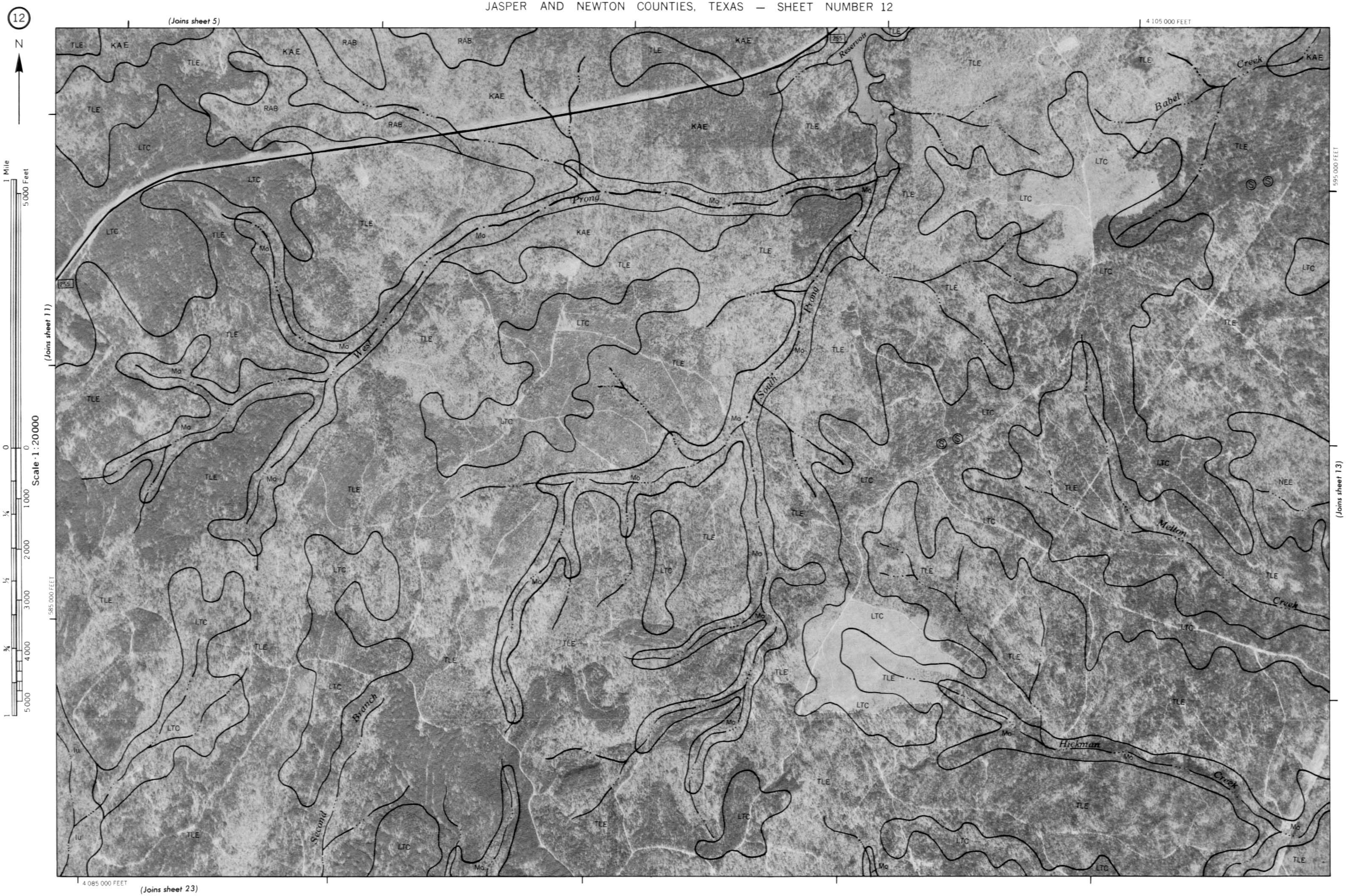
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(Joins sheet 13)
(Joins sheet 23)
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Reservoir
West Prong
South Prong
Babel Creek
Melton Creek
Hickman Creek
Second Branch
TLE
KAE
RAB
LTC
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NEE
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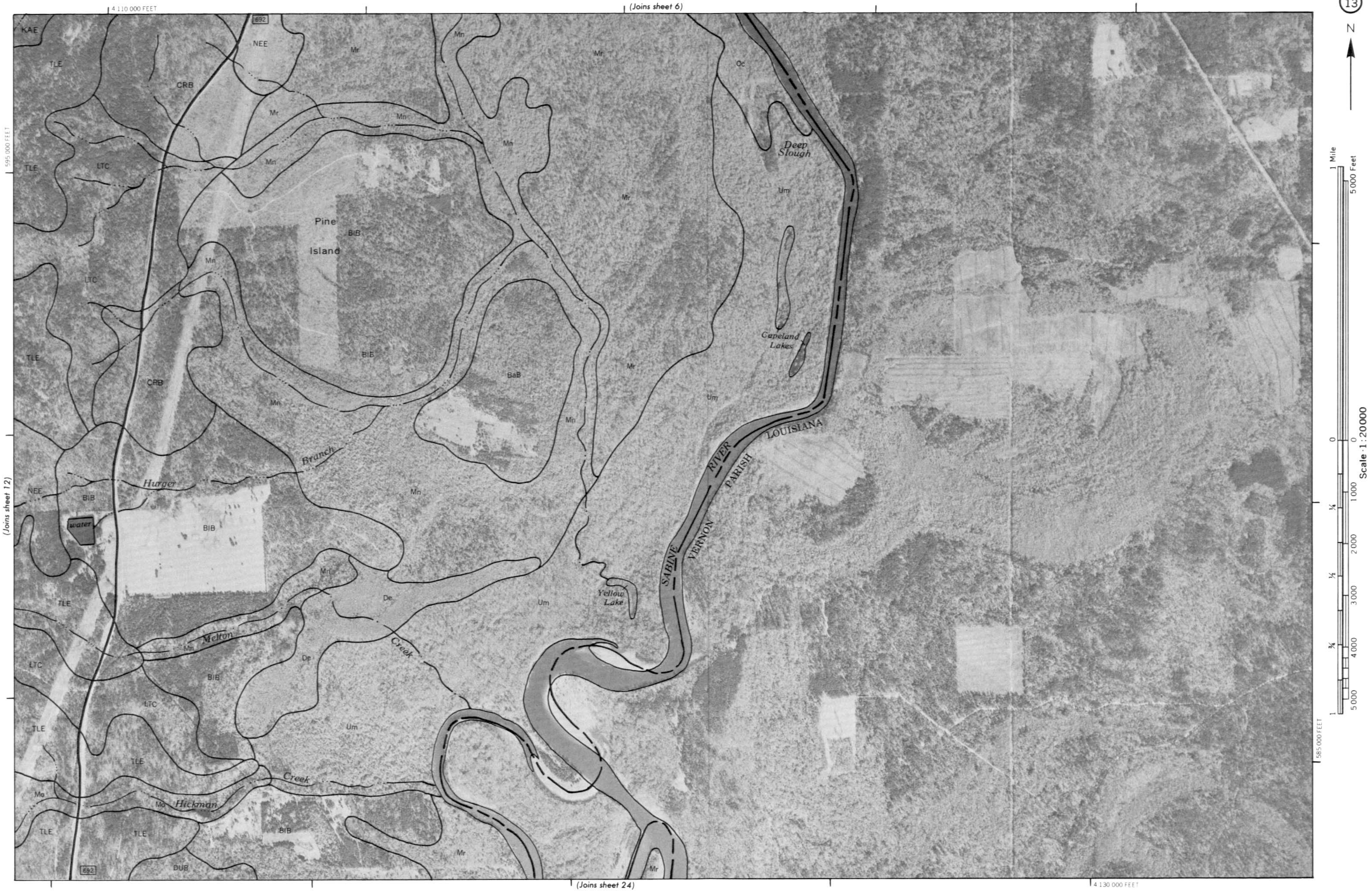

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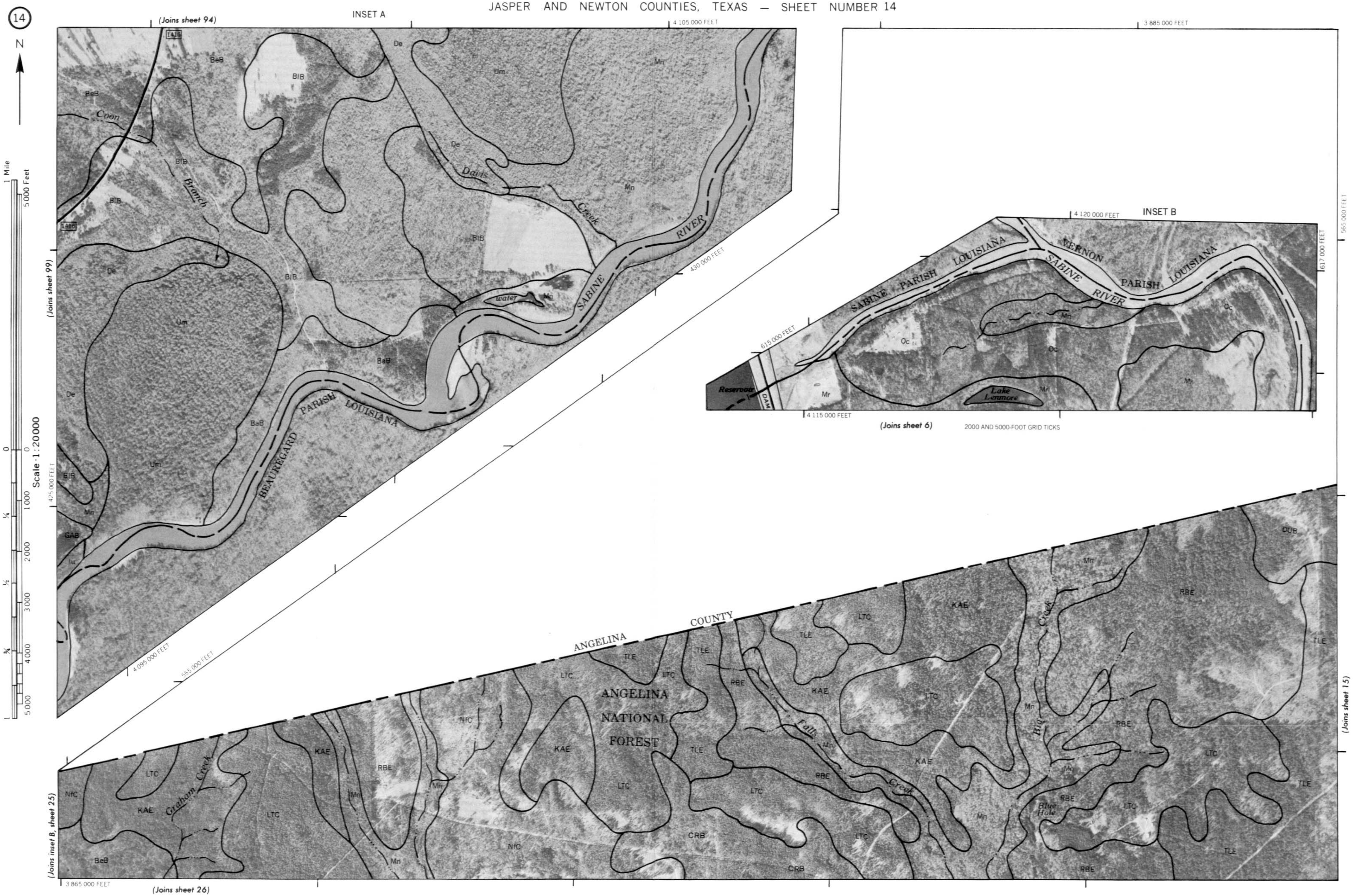

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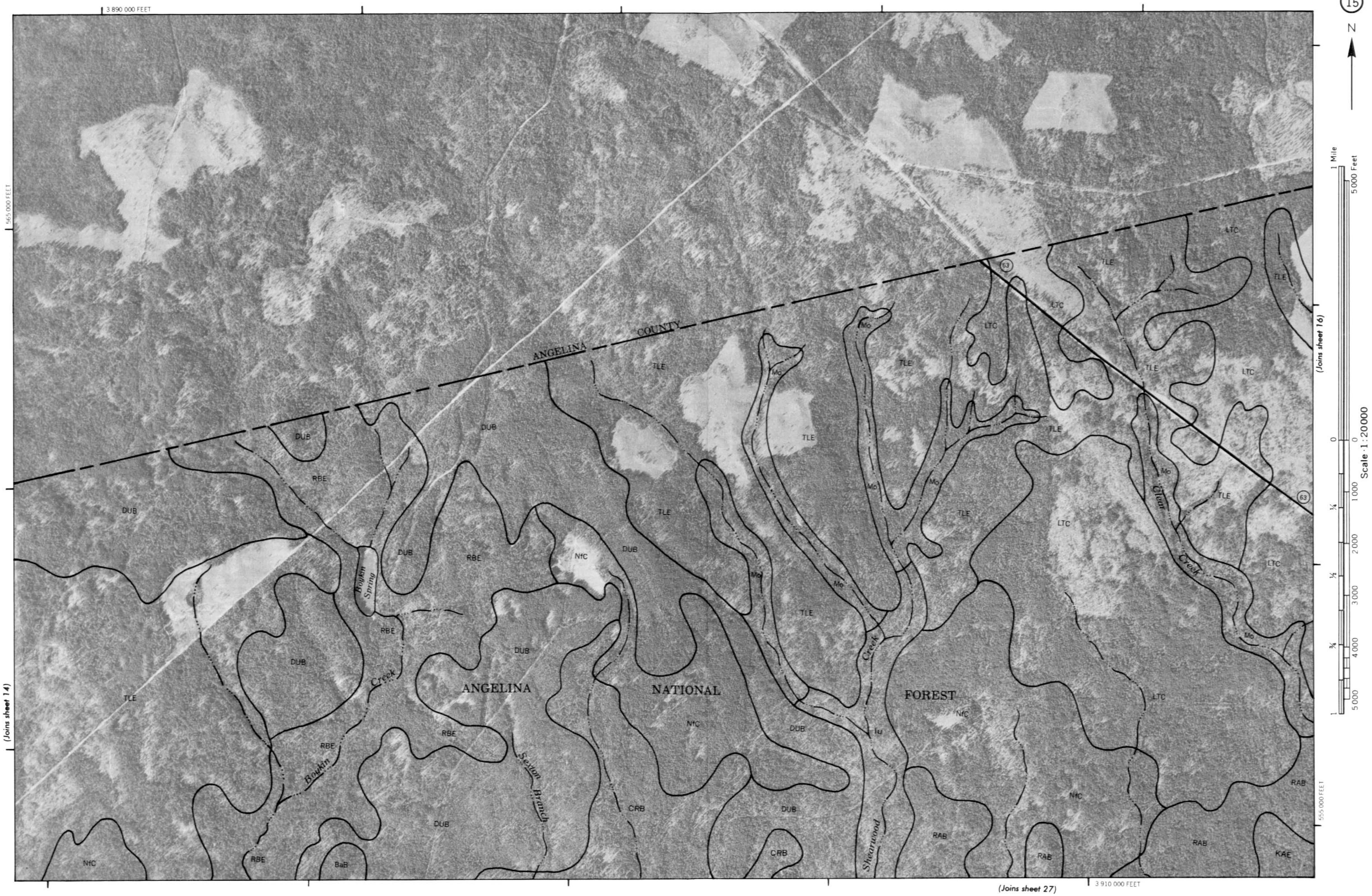

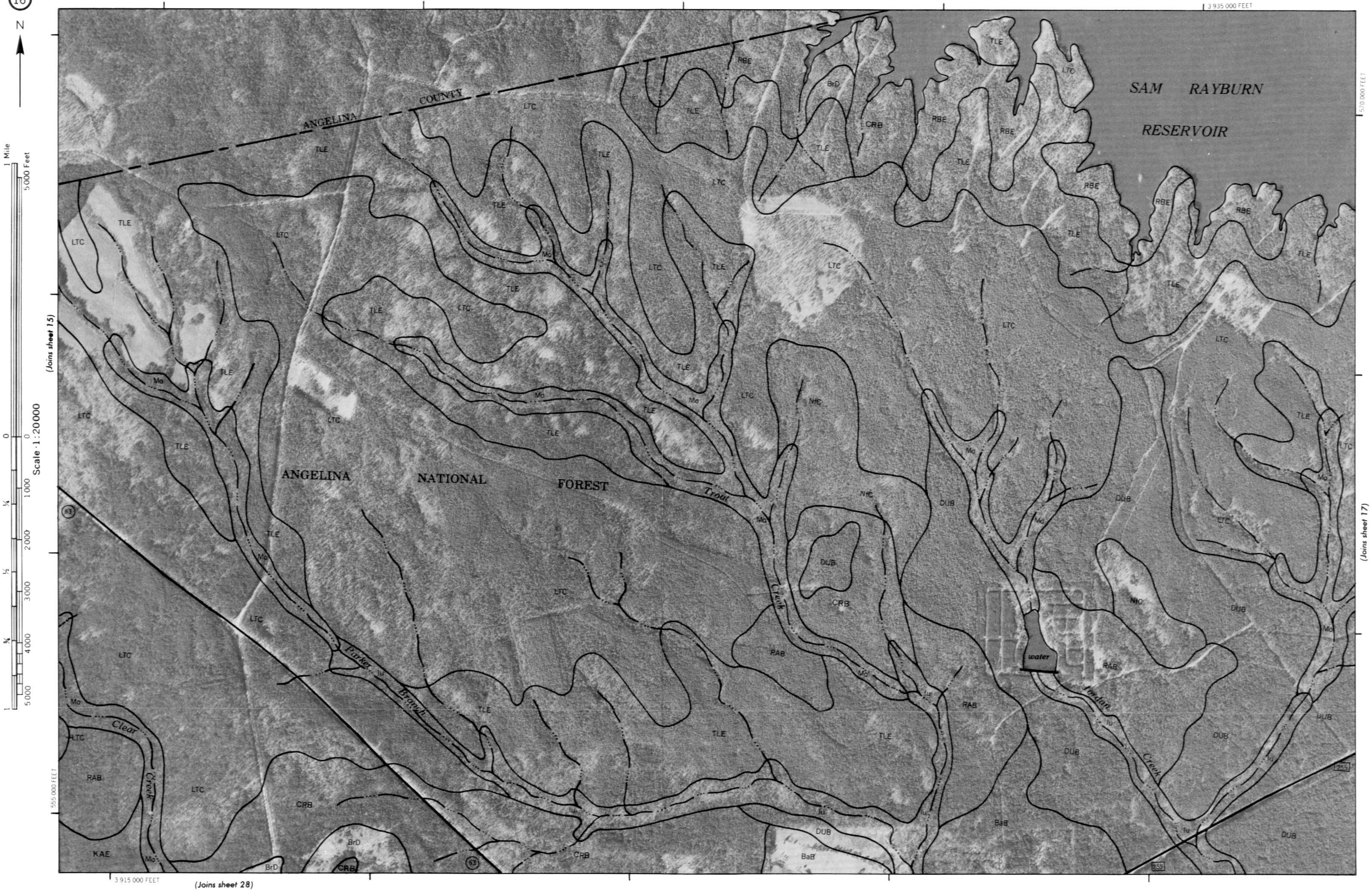
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2000
3000
4000
5000
3 935 000 FEET
570 000 FEET
555 000 FEET
3 915 000 FEET
(Joins sheet 15)
(Joins sheet 17)
(Joins sheet 28)
ANGELINA COUNTY
SAM RAYBURN RESERVOIR
ANGELINA NATIONAL FOREST
Trout Creek
Parker Branch
Clear Creek
Jordan Creek
water
63
255
TLE
LTC
RBE
BrD
CRB
Mo
NfC
DUB
RAB
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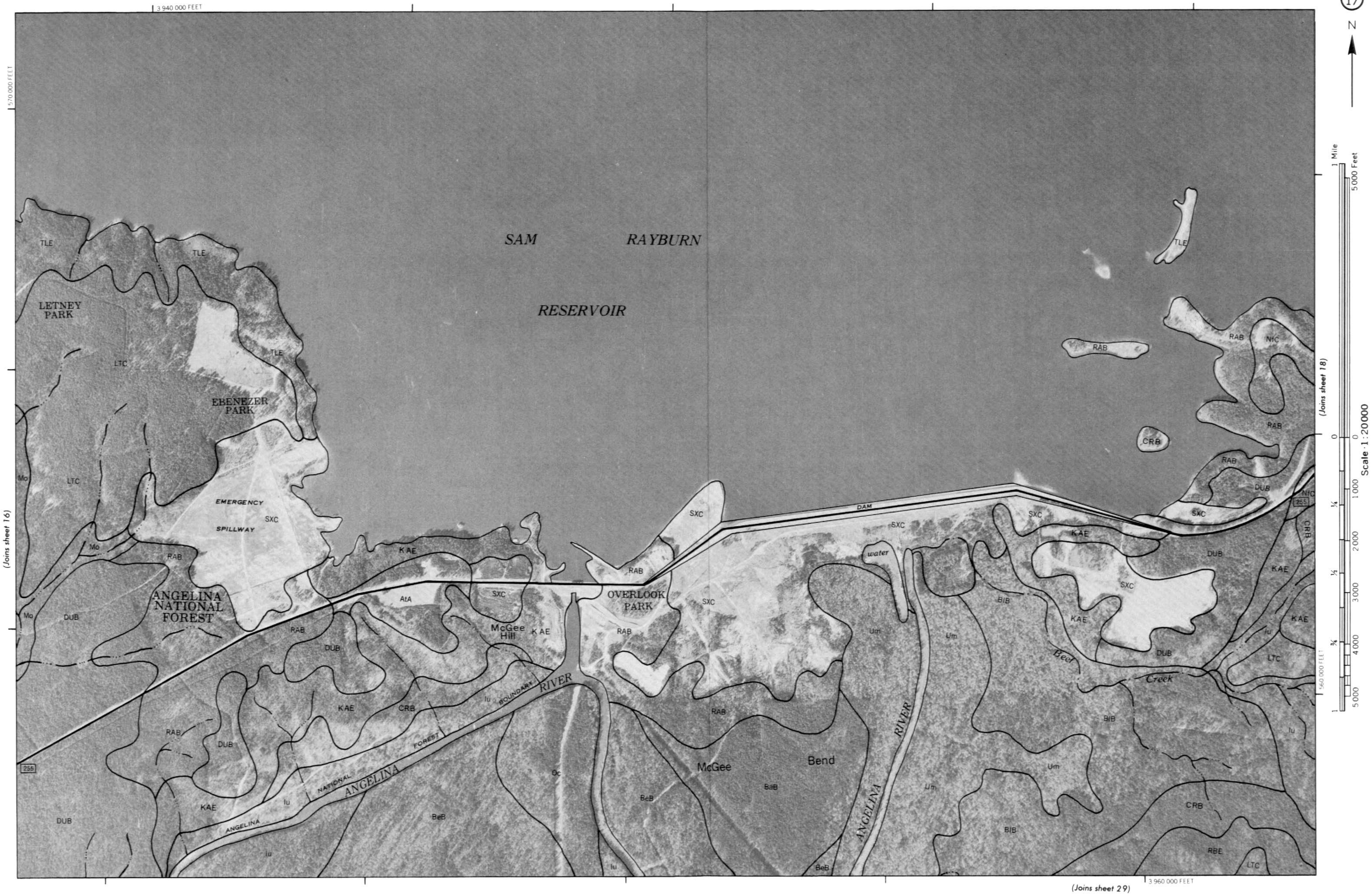
BaB
KAE


3 940 000 FEET
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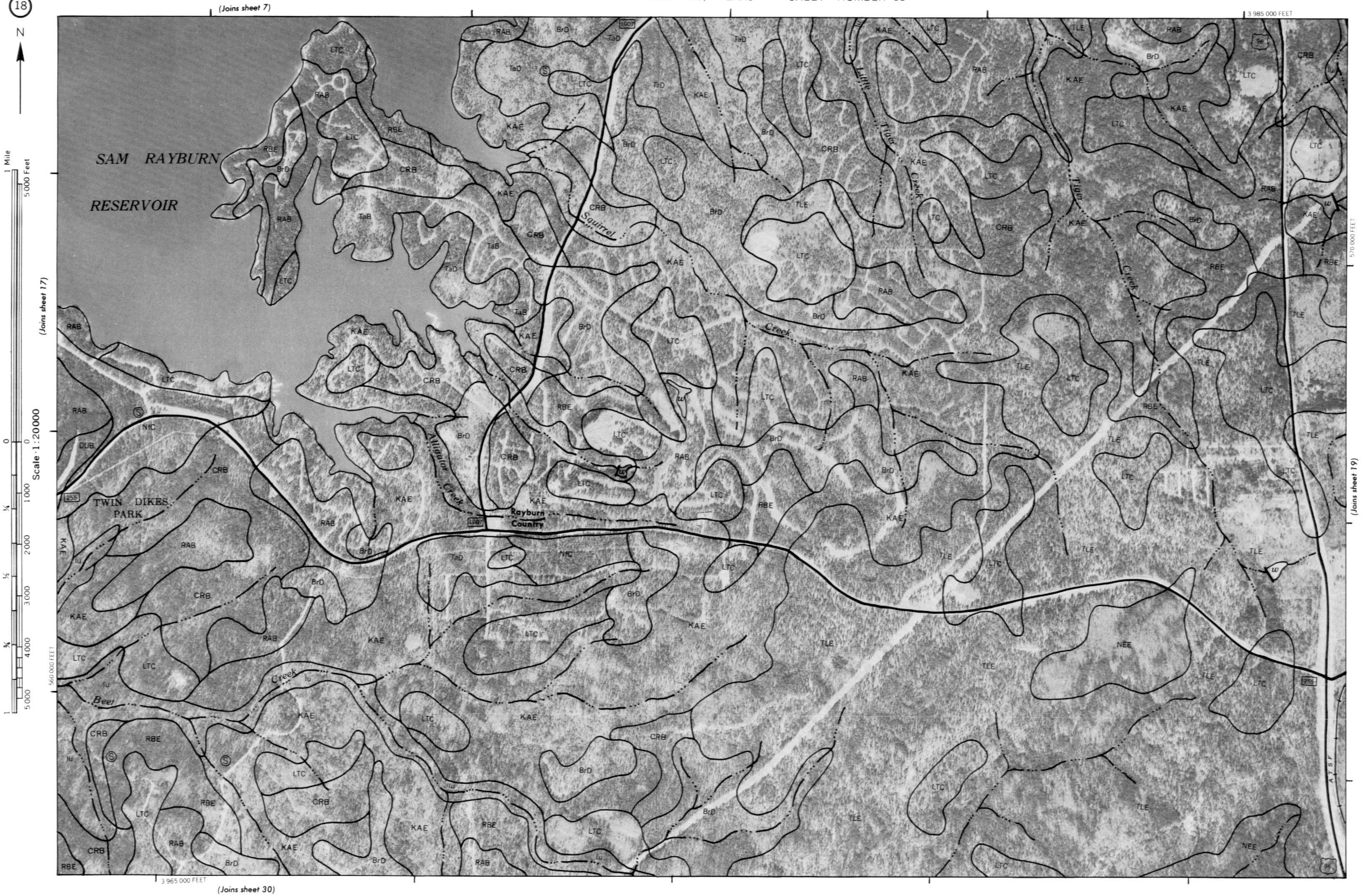
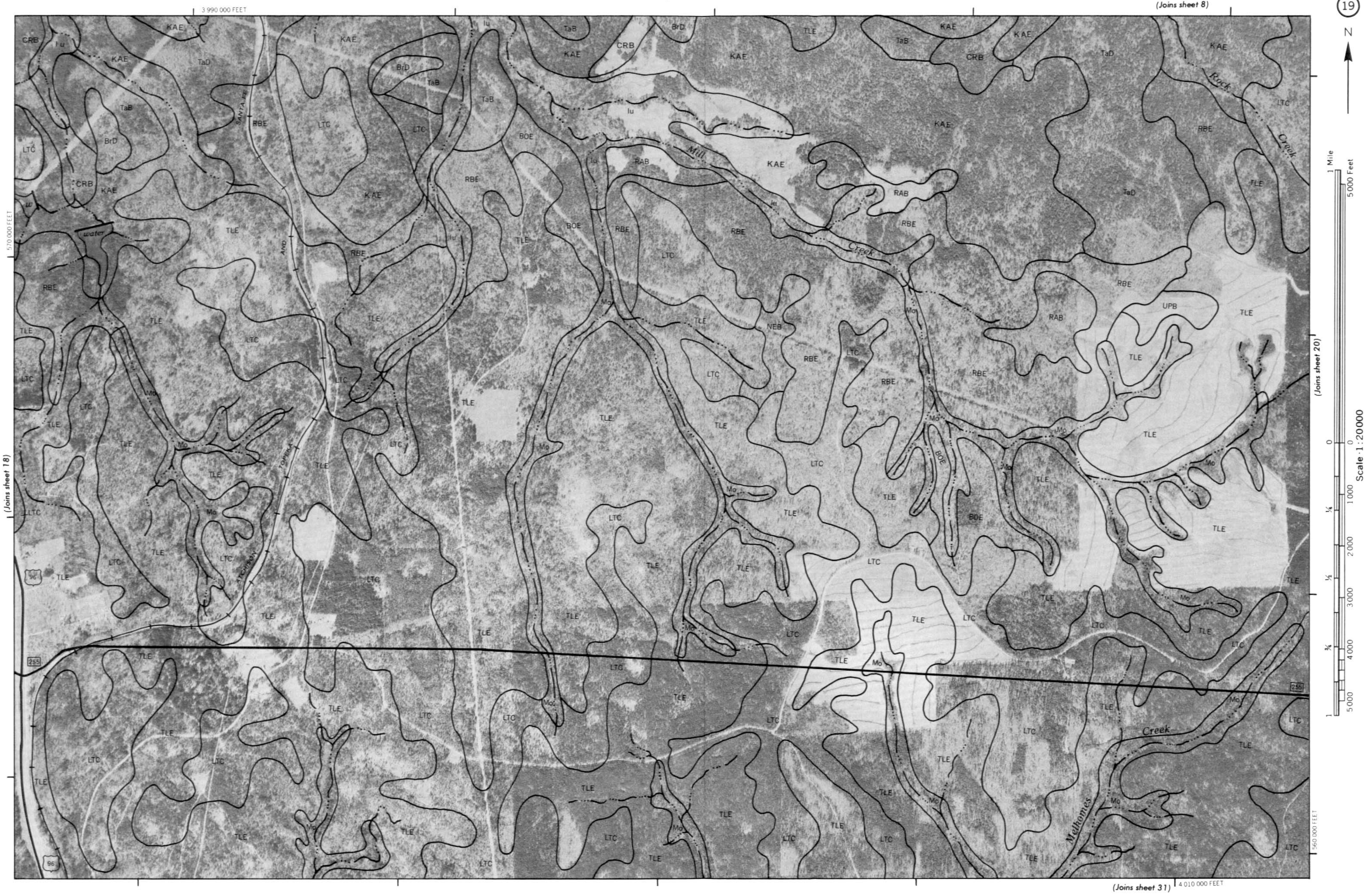
N
SAM RAYBURN RESERVOIR
LETNEY PARK
EBENEZER PARK
EMERGENCY SPILLWAY
ANGELINA NATIONAL FOREST
OVERLOOK PARK
McGee Hill
McGee Bend
DAM
water
ANGELINA RIVER
ANGELINA NATIONAL FOREST BOUNDARY
Beef Creek
255
TLE
LTC
Mo
SXC
RAB
DUB
KAE
AtA
CRB
Iu
Oc
BeB
BaB
Um
BIB
NfC
CRB
RBE
(Joins sheet 16)
(Joins sheet 18)
(Joins sheet 29)
560 000 FEET
3 960 000 FEET
1 Mile
5000 Feet
0
¼
½
¾
1
1000
2000
3000
4000
5000
Scale 1:20000

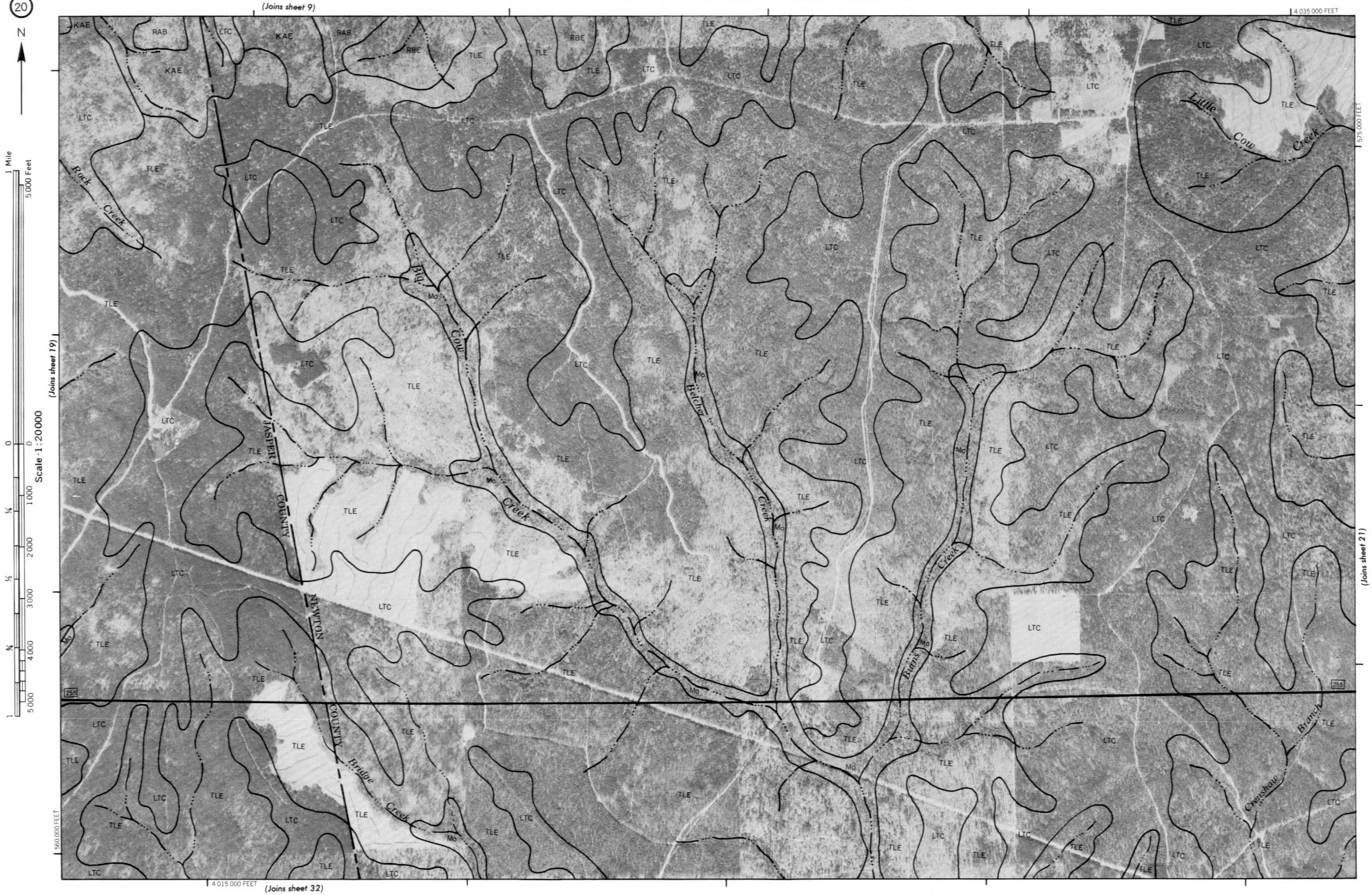
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 18



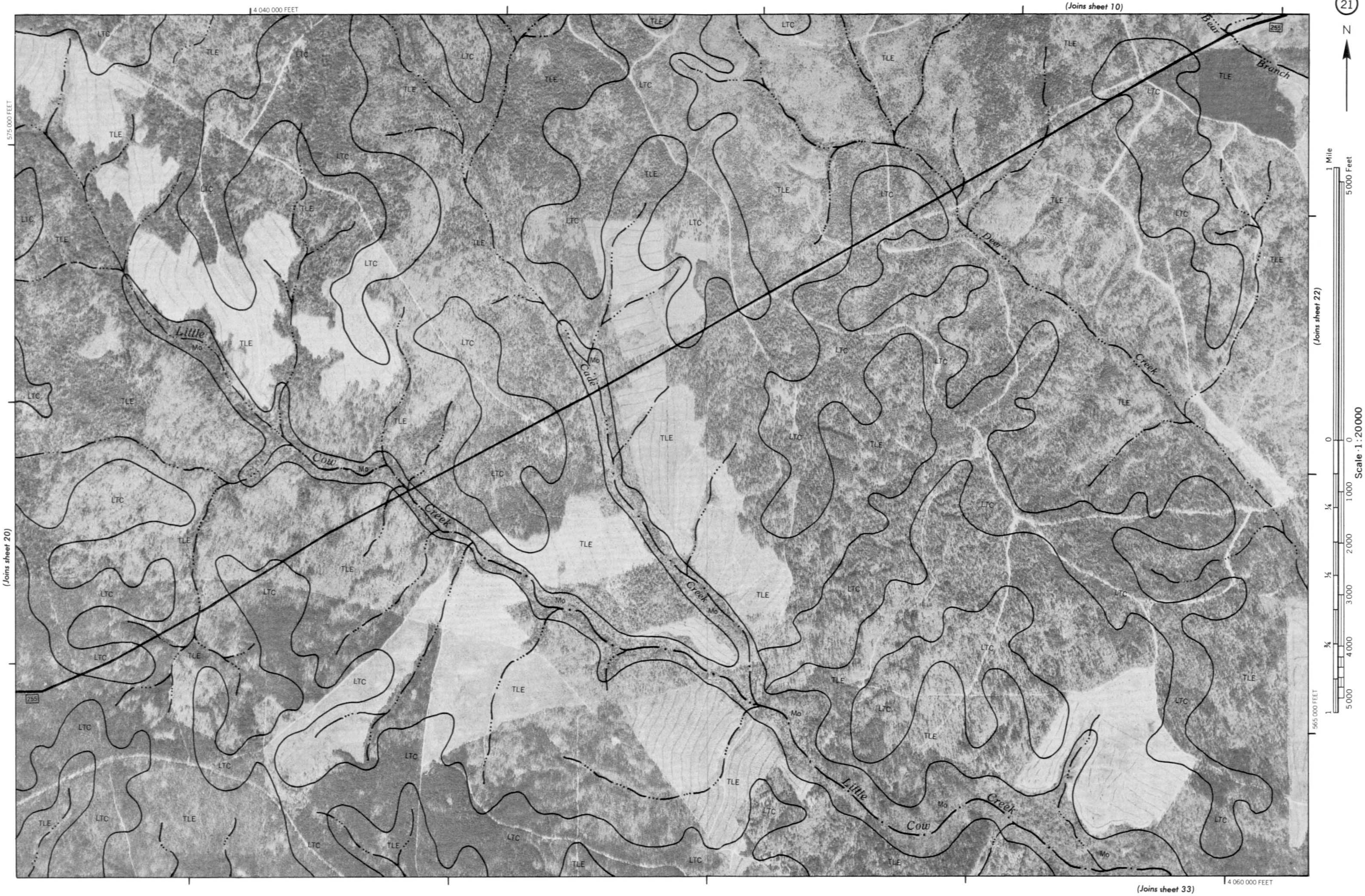
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 19



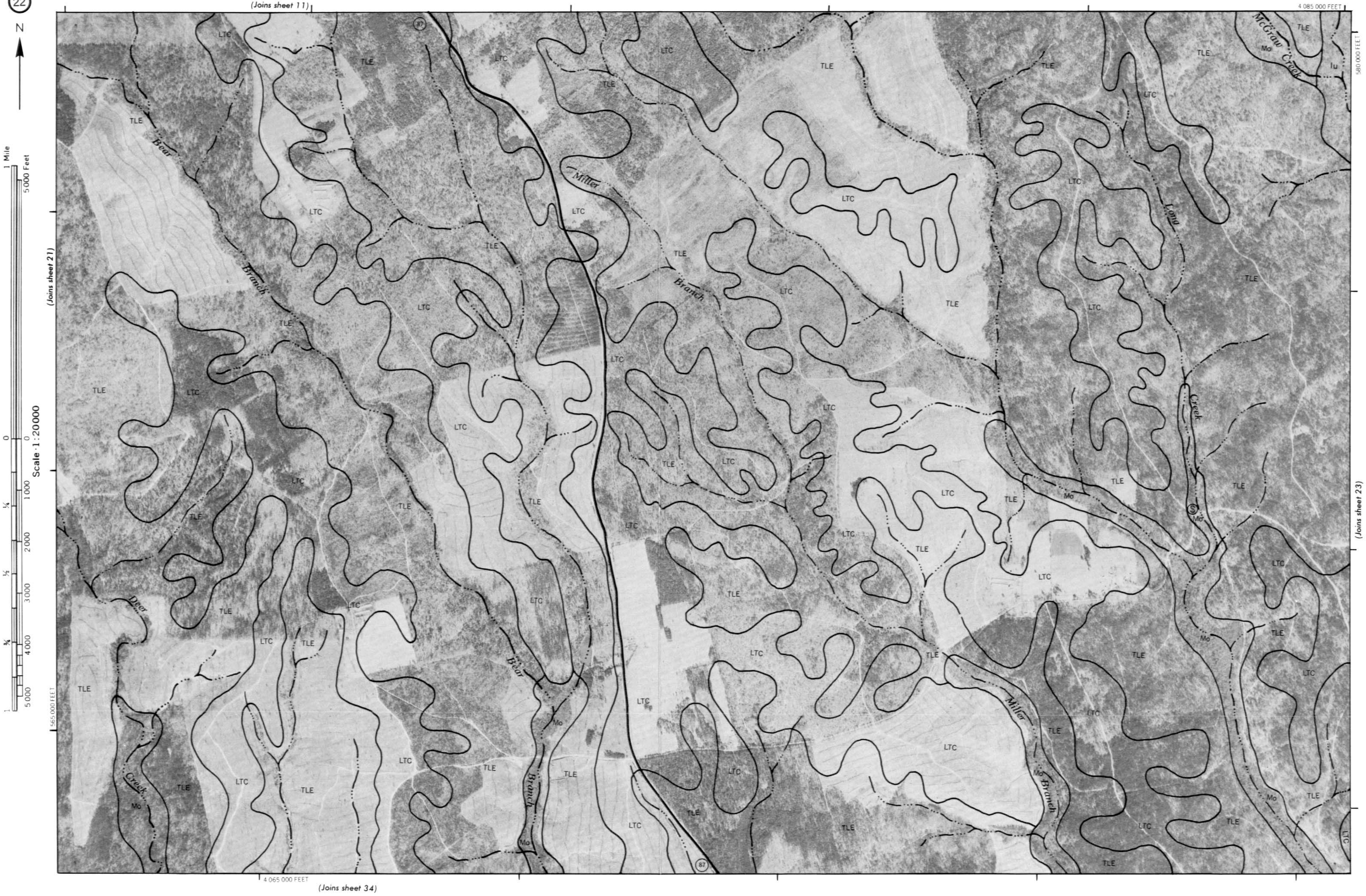
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 20



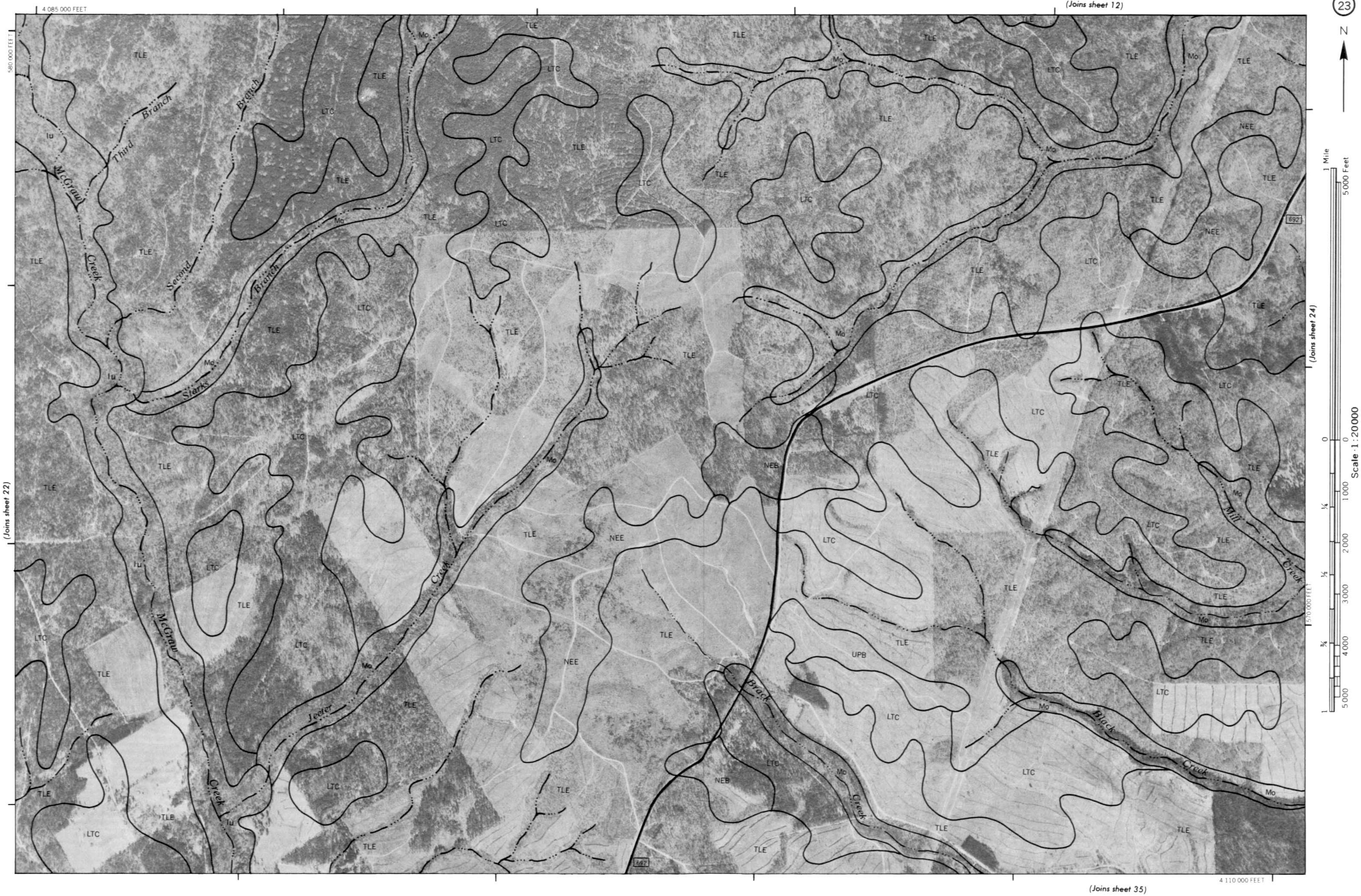
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 21

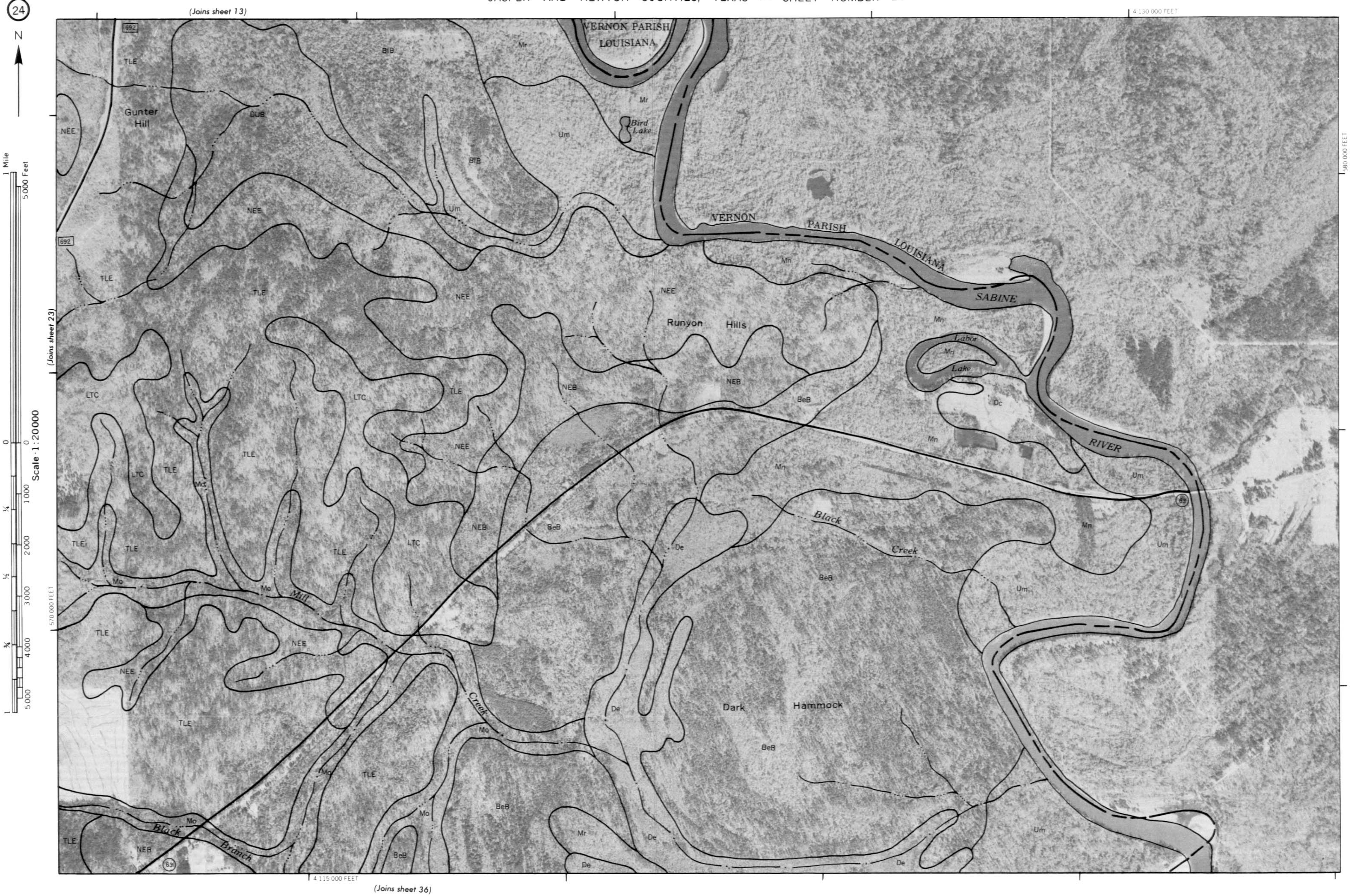


JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 22

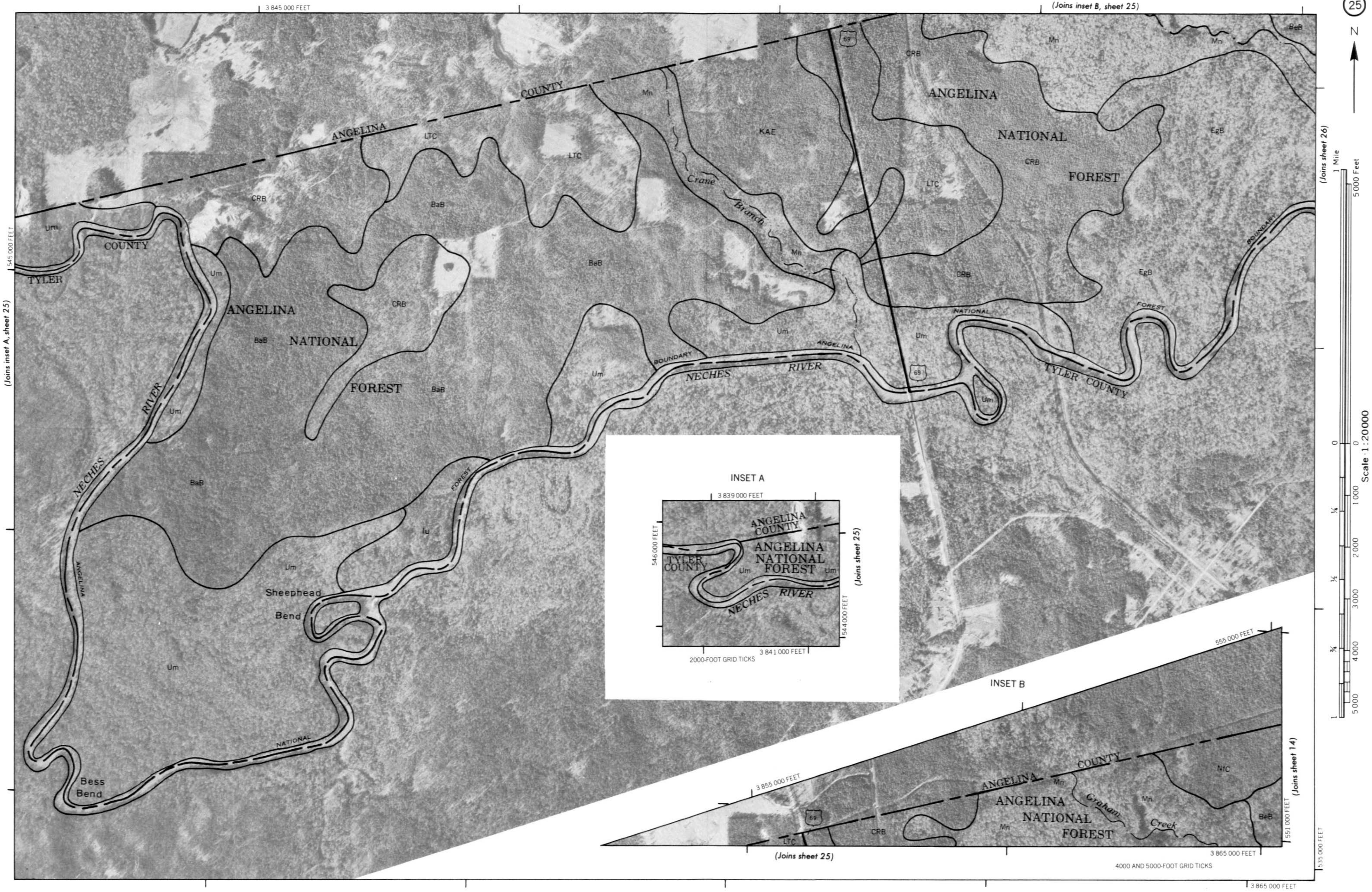


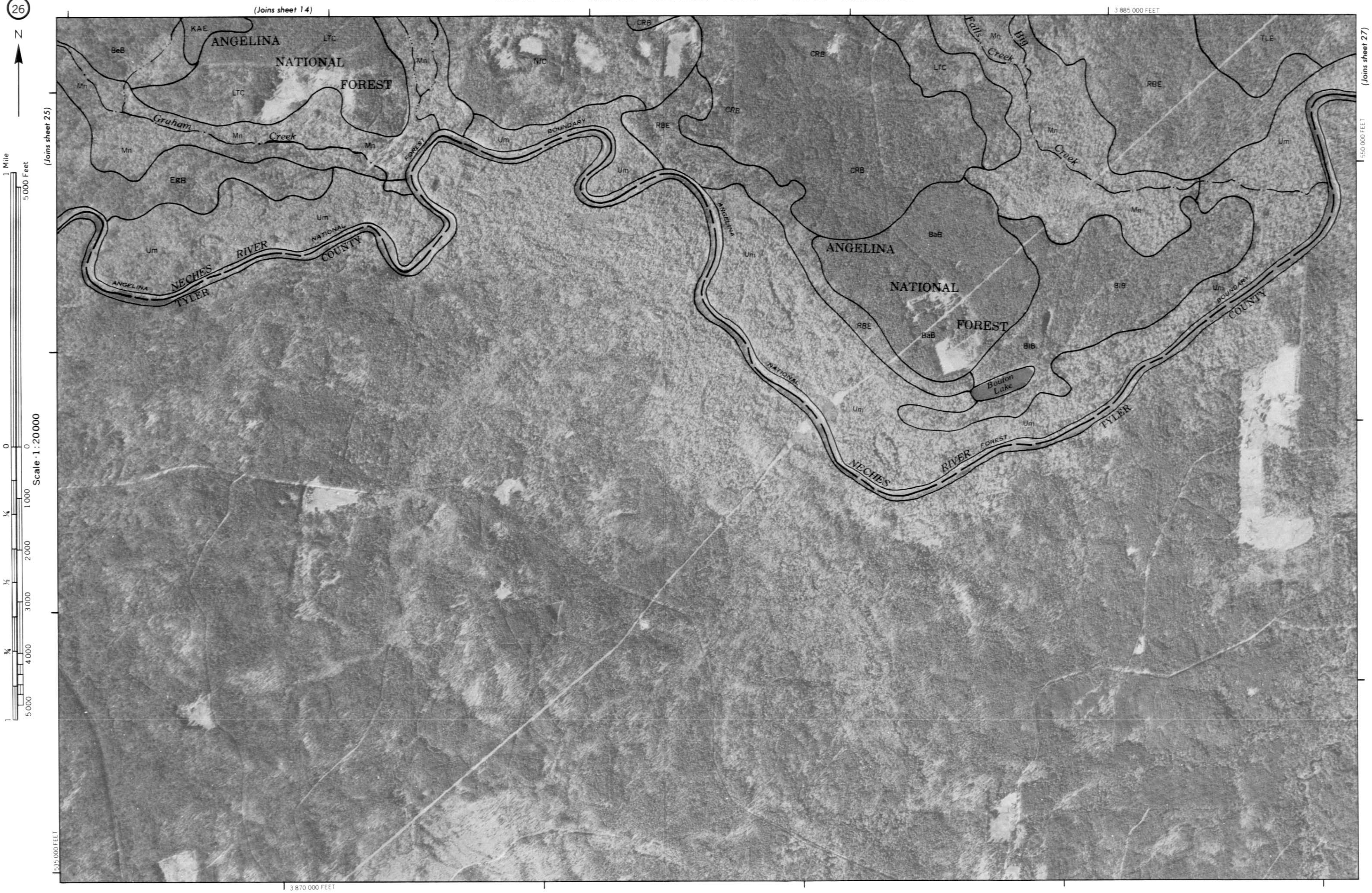
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 23



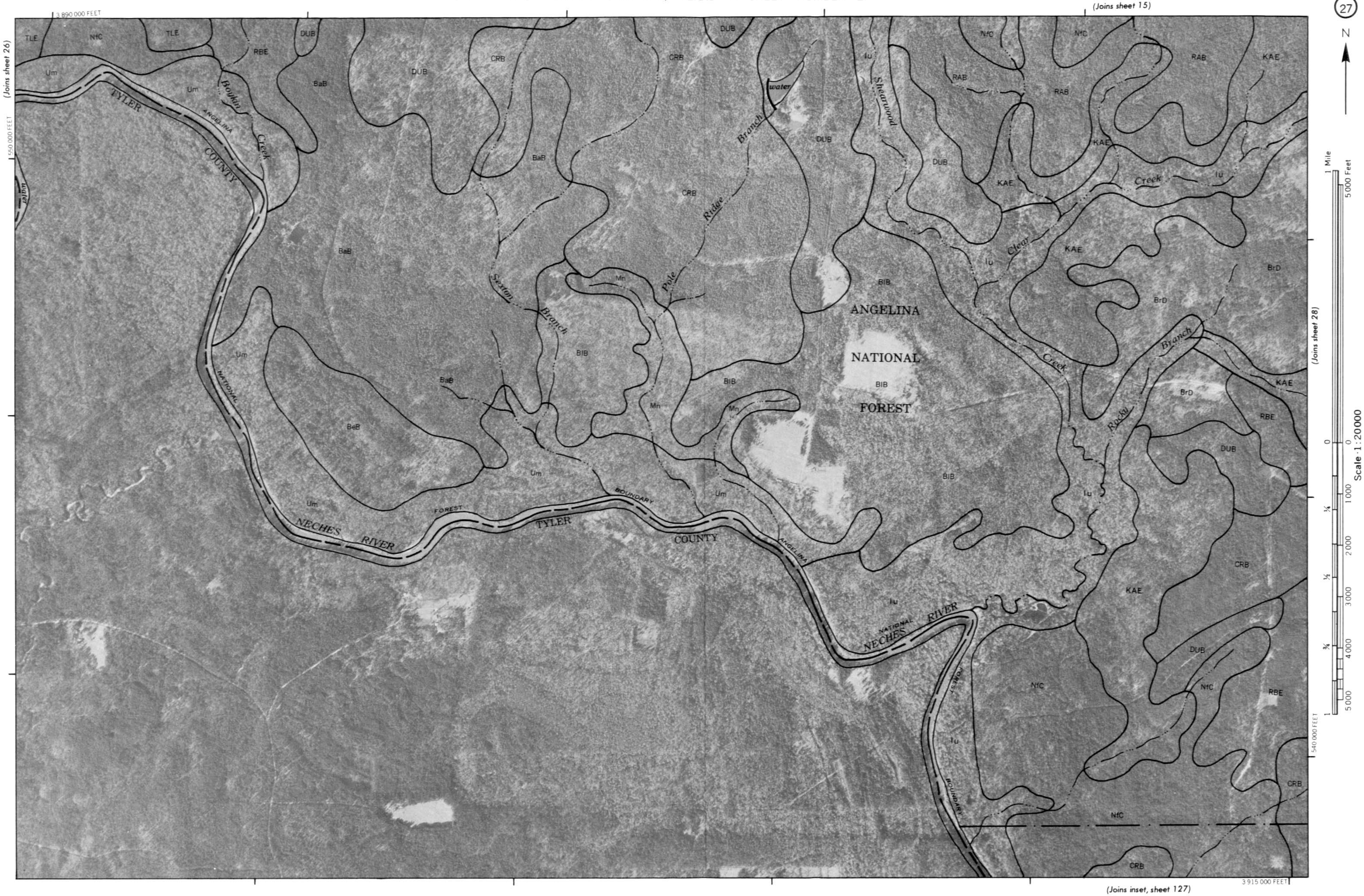

24
N
(Joins sheet 13)
(Joins sheet 23)
(Joins sheet 36)
4 130 000 FEET
580 000 FEET
570 000 FEET
4 115 000 FEET
1 Mile
5 000 Feet
Scale 1:20000
0
¼
½
¾
1
0
1000
2000
3000
4000
5000
692
63
VERNON PARISH
LOUISIANA
VERNON PARISH LOUISIANA
SABINE RIVER
Gunter Hill
Bird Lake
Runyon Hills
Labor Lake
Black Creek
Mill Creek
Black Branch
Dark Hammock
TLE
NEE
DUB
BIB
Mr
Um
LTC
Mo
NEB
BeB
Mn
De
Dc

JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 25

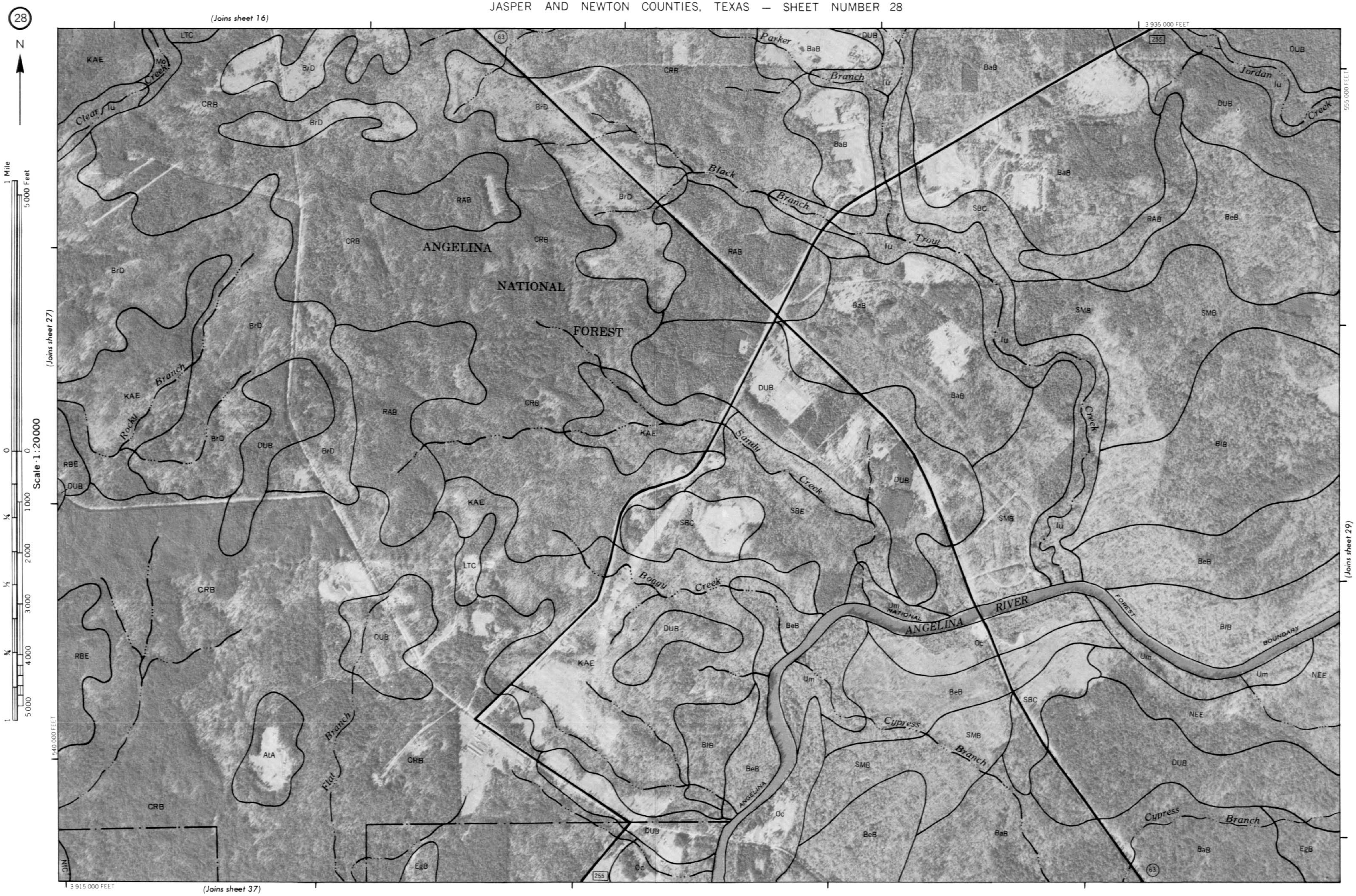



26
N
(Joins sheet 14)
(Joins sheet 25)
(Joins sheet 27)
3 885 000 FEET
550 000 FEET
535 000 FEET
3 870 000 FEET
1 Mile
5000 Feet
Scale 1:20000
0
¼
½
¾
1
0
1000
2000
3000
4000
5000
KAE
BeB
ANGELINA
NATIONAL
FOREST
LTC
Mn
NIC
CRB
Graham
Creek
EgB
Um
FOREST
BOUNDARY
ANGELINA
NATIONAL
NECHES
RIVER
TYLER
COUNTY
RBE
Falls
Creek
Big
Creek
TLE
BaB
BIB
Bouton Lake

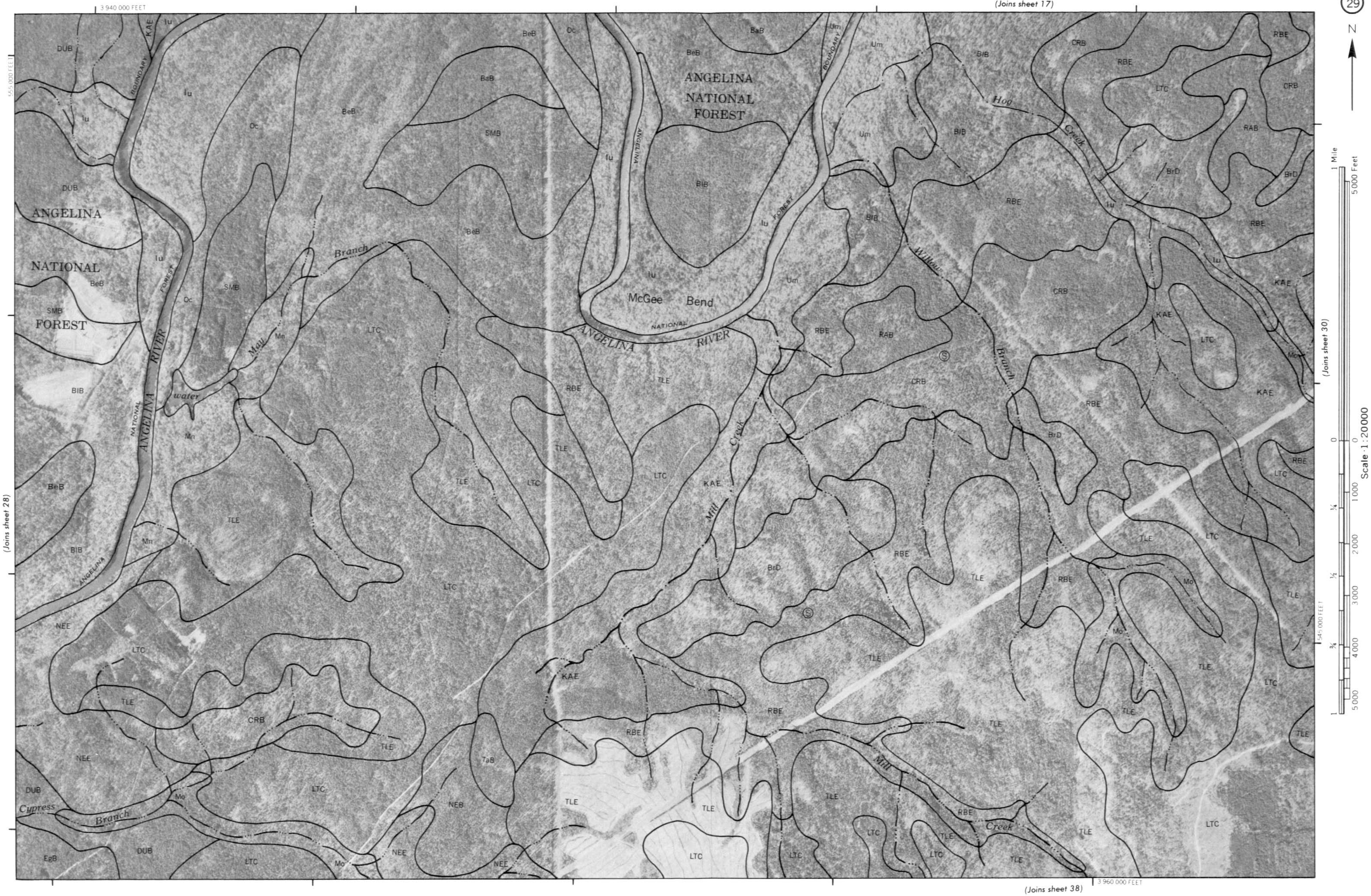
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 27

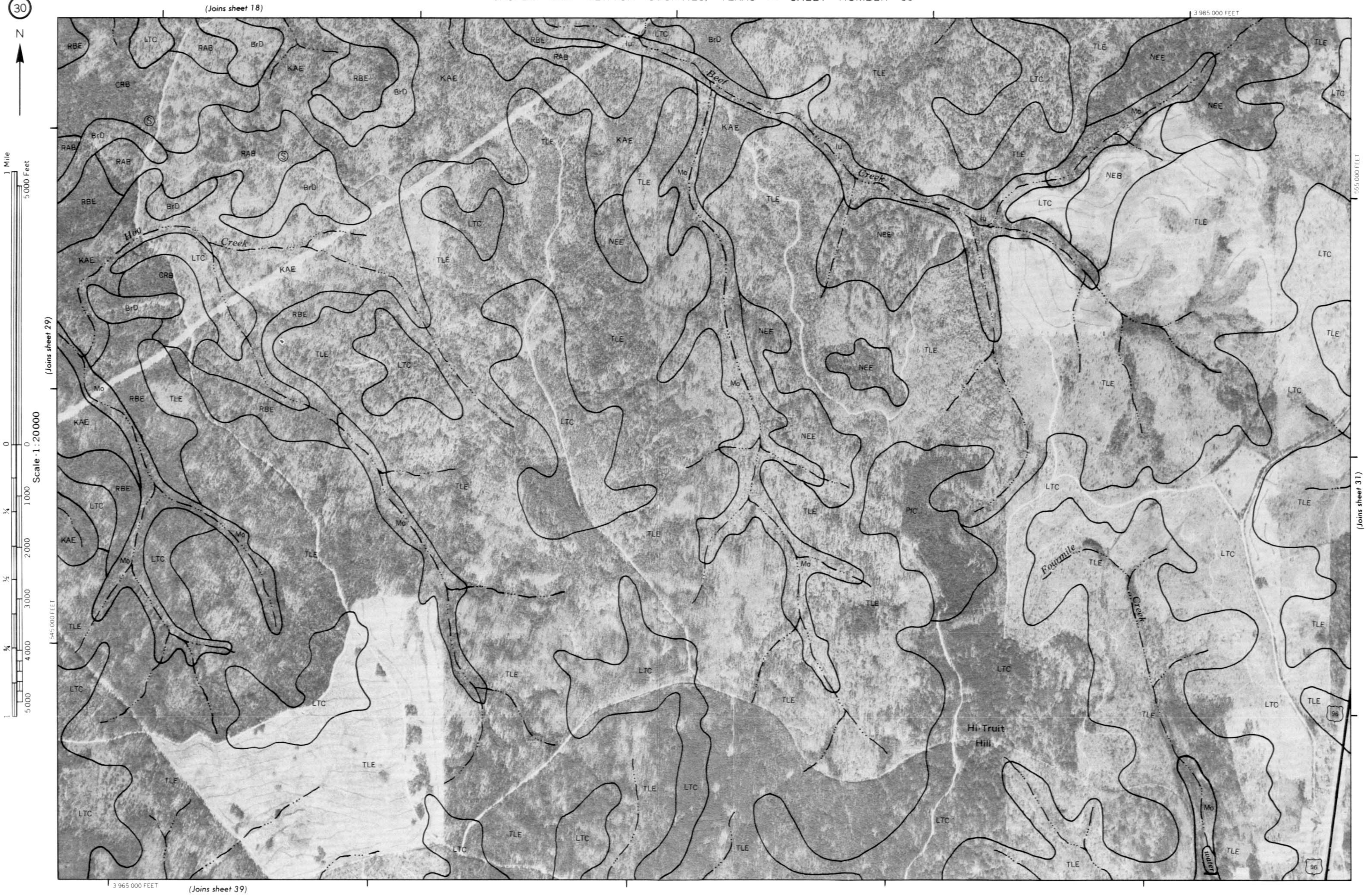


JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 28

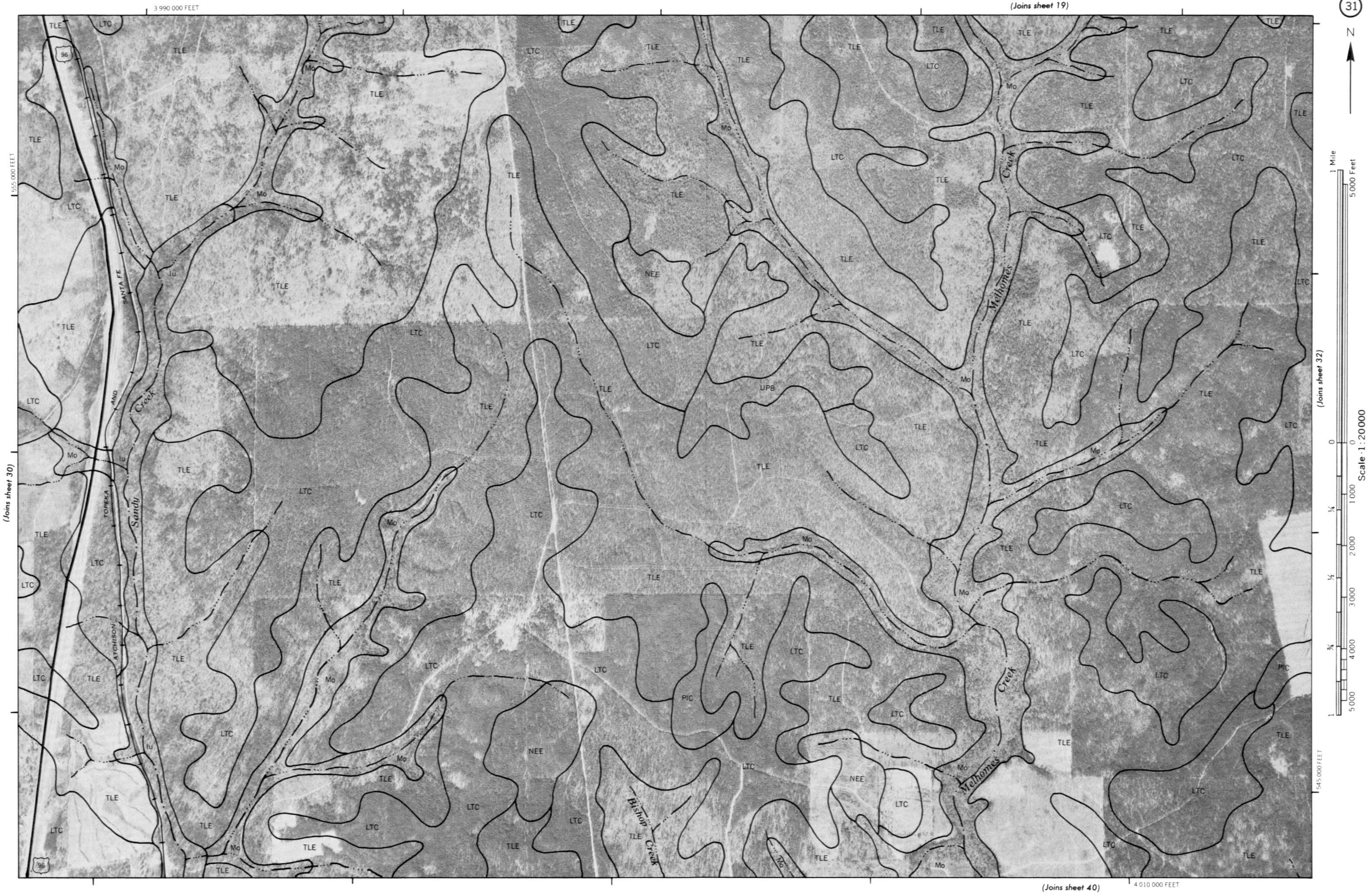


JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 29

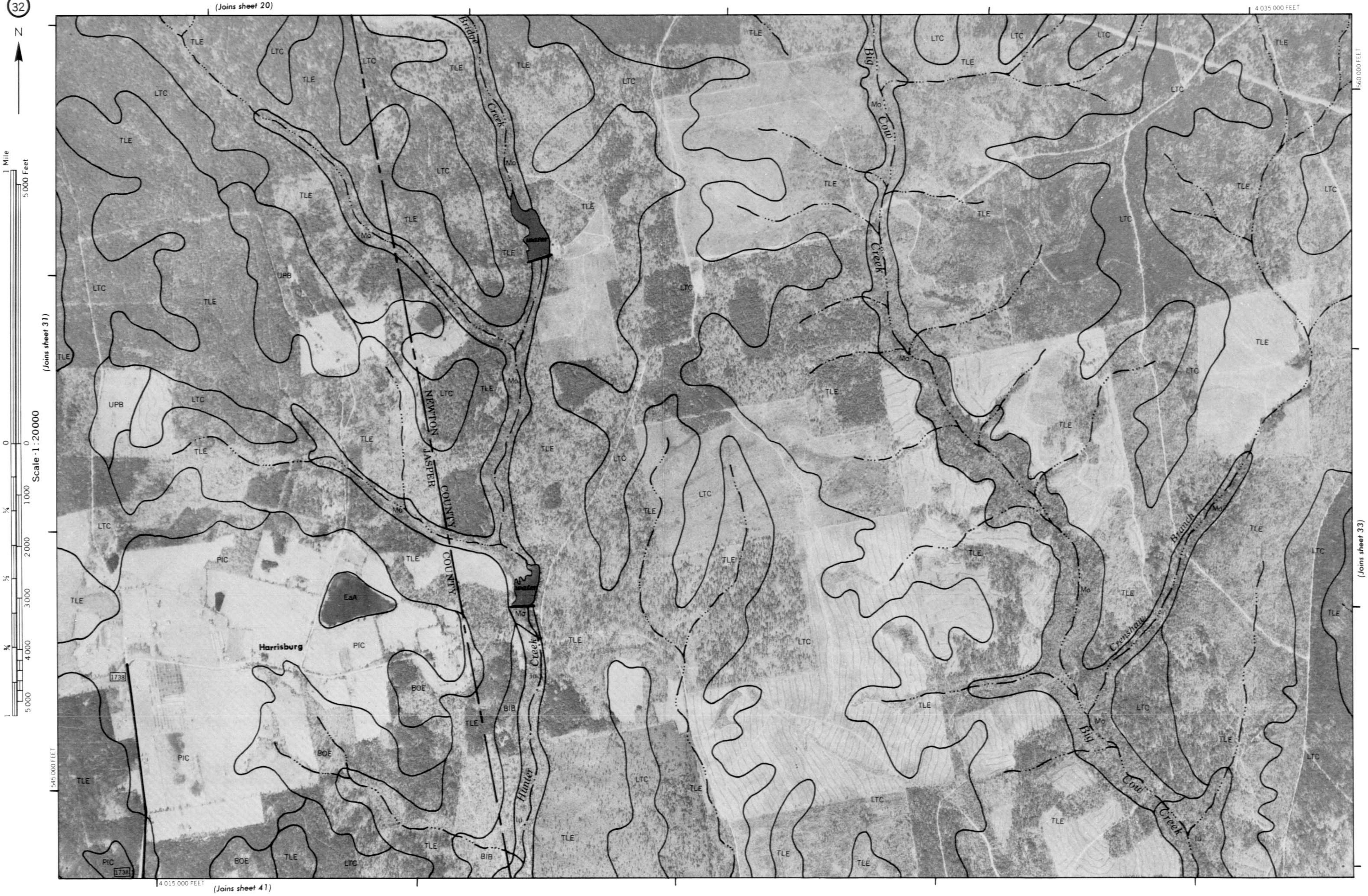


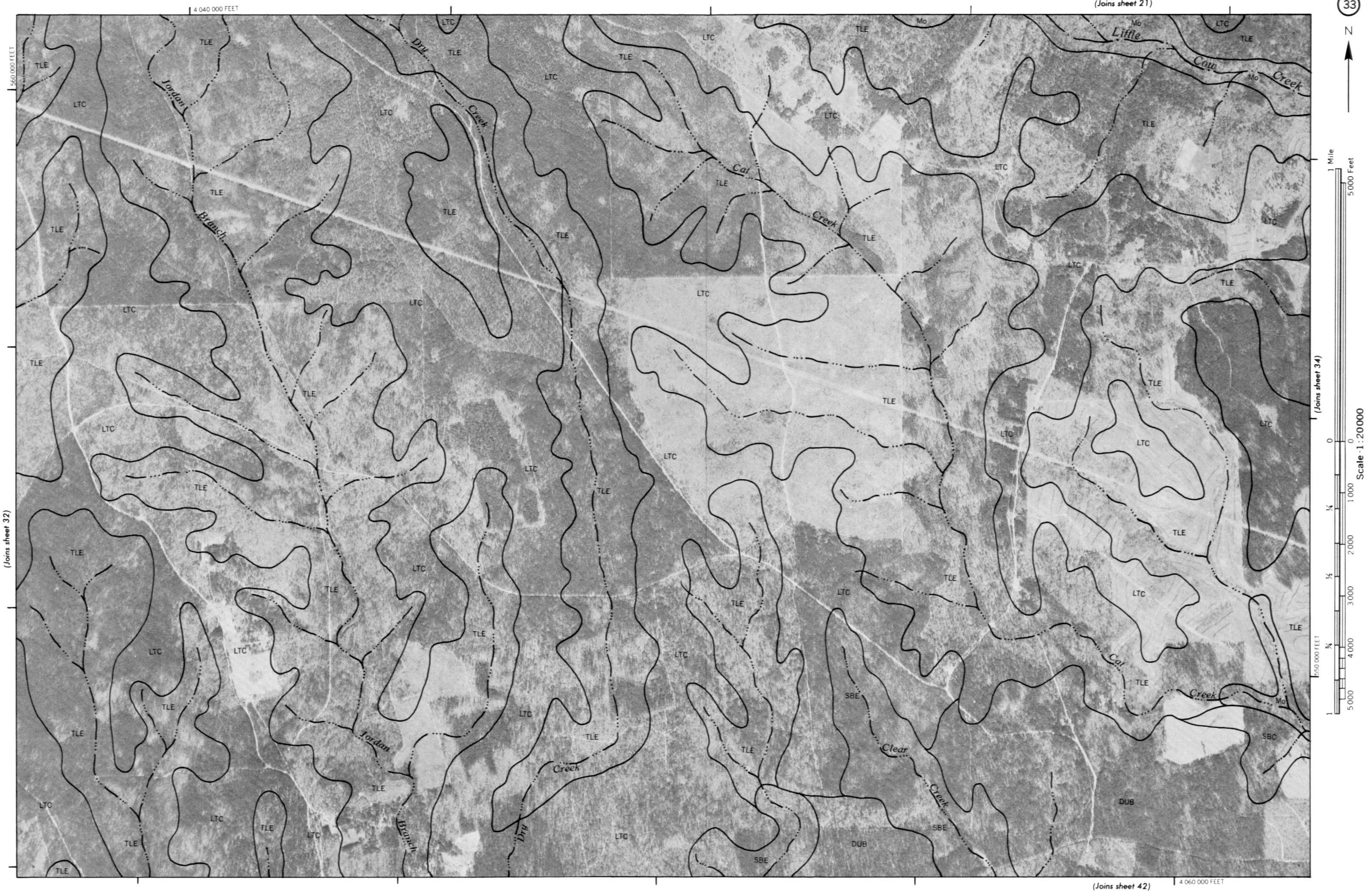

N
1 Mile
5 000 Feet
Scale 1:20 000
0
1000
2000
3000
4000
5000
¼
½
¾
(Joins sheet 18)
(Joins sheet 29)
(Joins sheet 31)
(Joins sheet 39)
3 985 000 FEET
3 965 000 FEET
555 000 FEET
545 000 FEET
Beef Creek
Hog Creek
Fourmile Creek
Hi-Truit Hill
water
96
RBE
RAB
BrD
CRB
KAE
LTC
TLE
NEE
NEB
Mo
Iu
PfC

JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 31

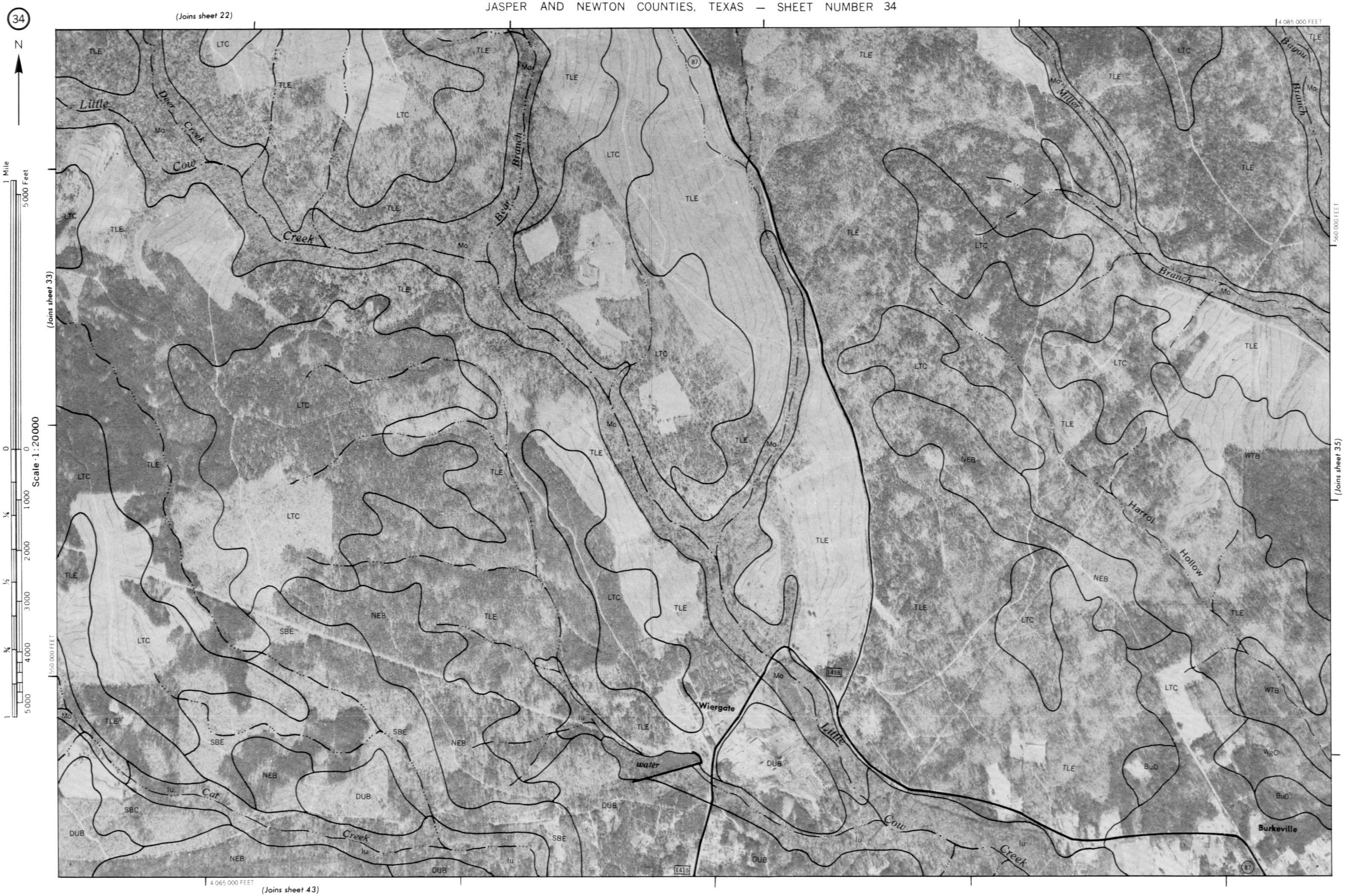


JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 32

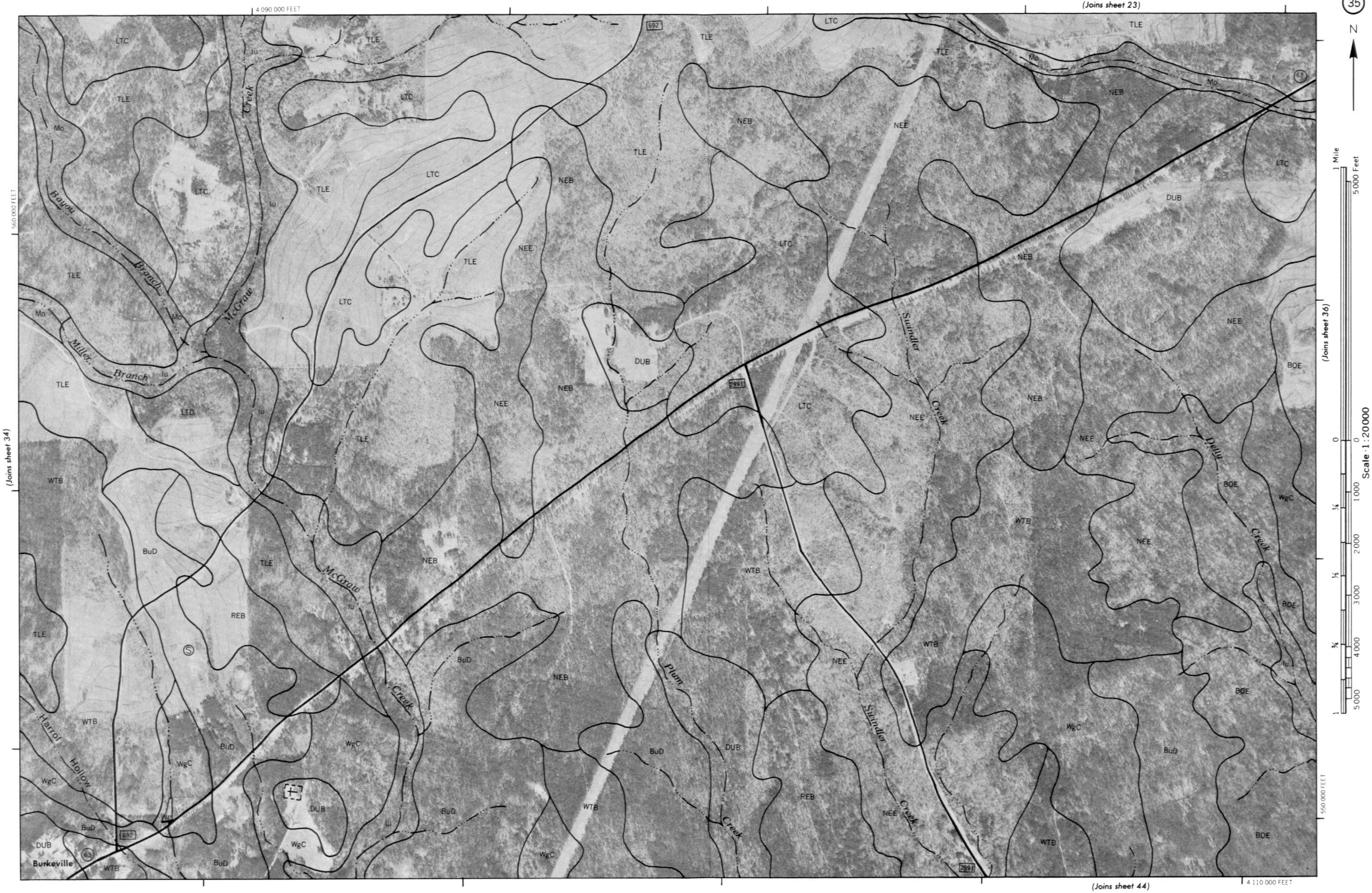


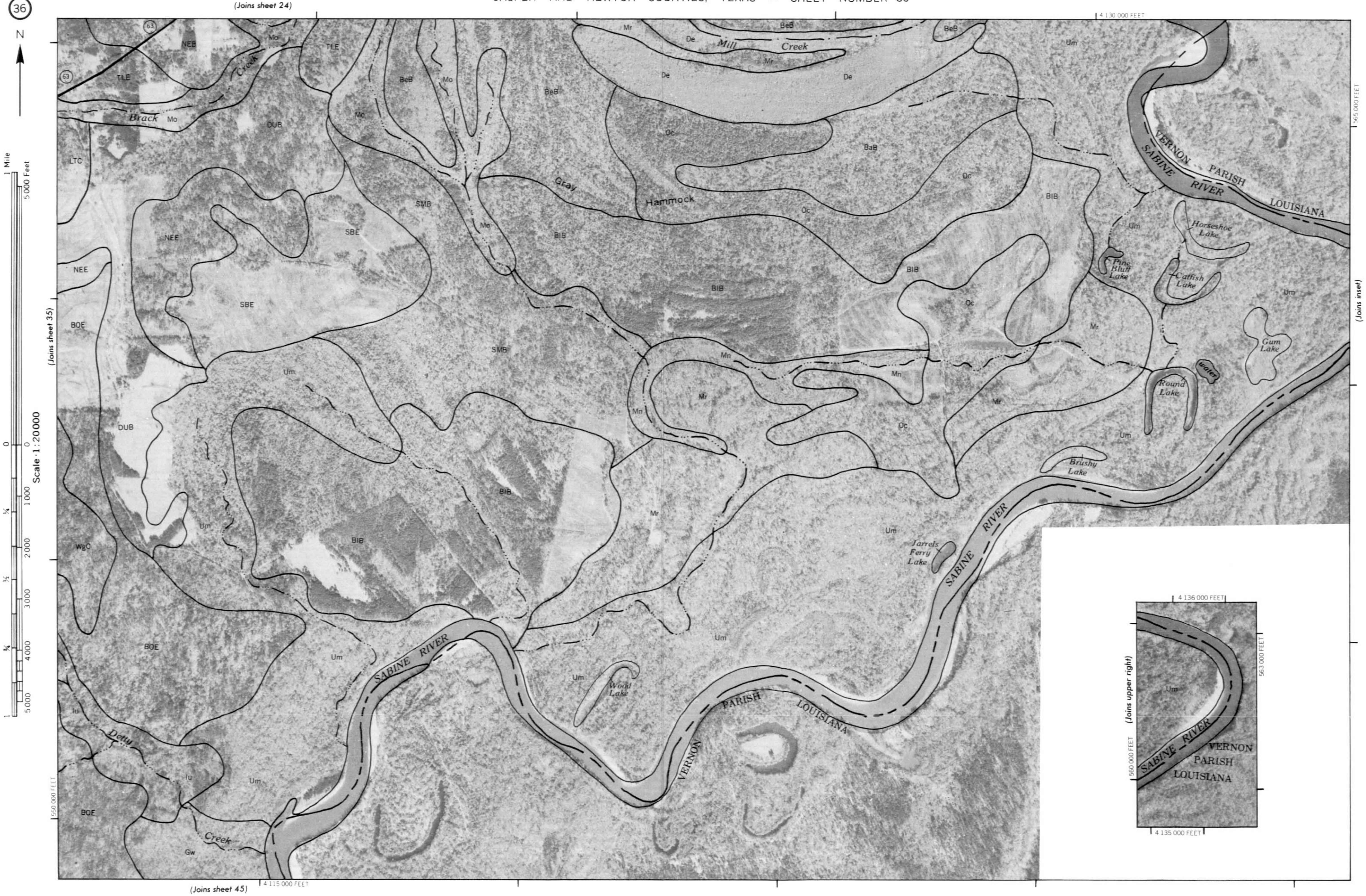

33
N
(Joins sheet 21)
4 040 000 FEET
560 000 FEET
(Joins sheet 32)
(Joins sheet 34)
(Joins sheet 42)
4 060 000 FEET
550 000 FEET
Jordan Branch
Dry Creek
Cat Creek
Little Cow Creek
Clear Creek
Jordan Branch
Dry Creek
Cat Creek
LTC
TLE
Mo
SBE
SBC
DUB
1 Mile
5000 Feet
0
¼
½
¾
1
0
1000
2000
3000
4000
5000
Scale 1:20000

JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 34

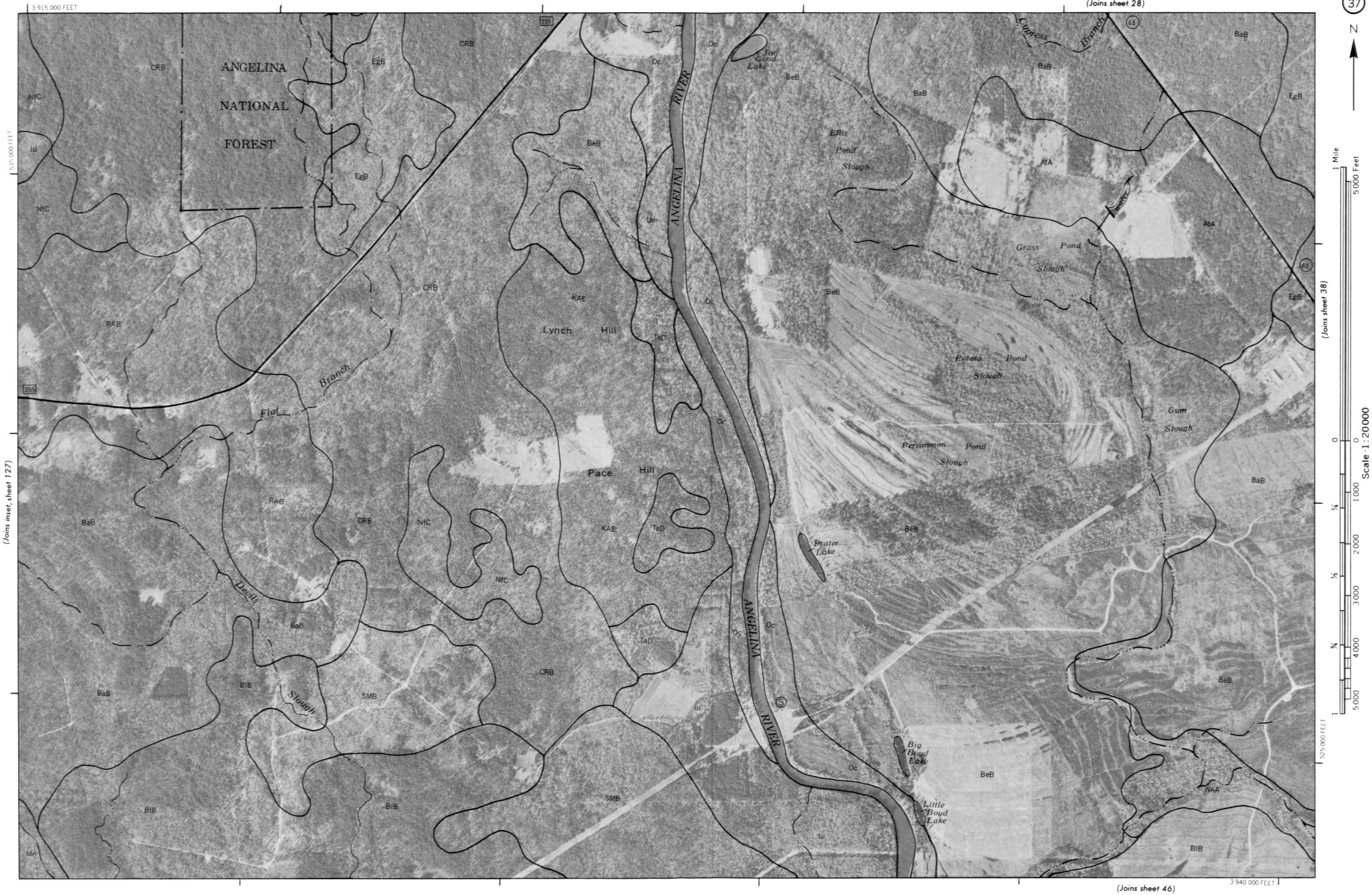


JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 35

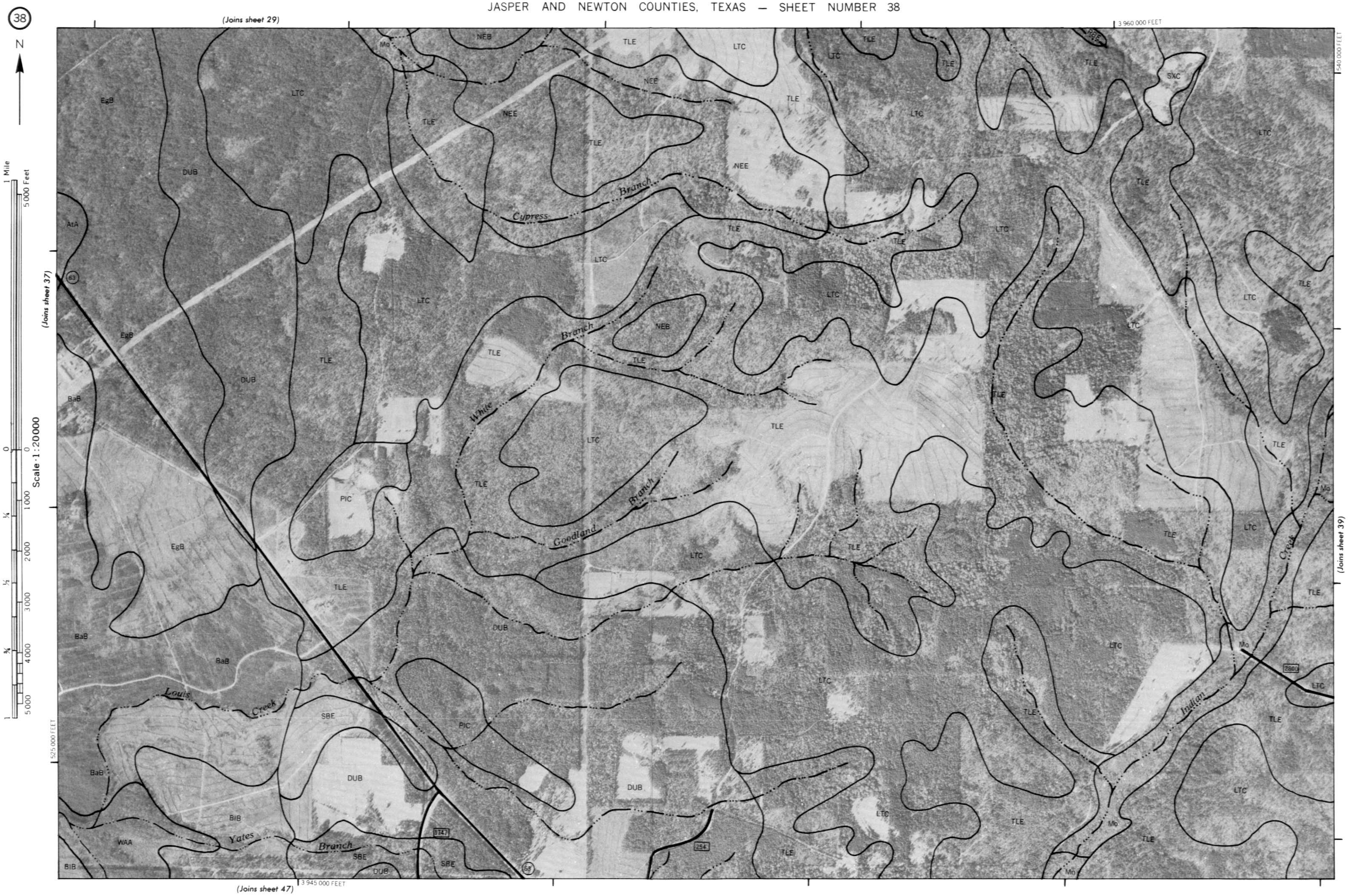


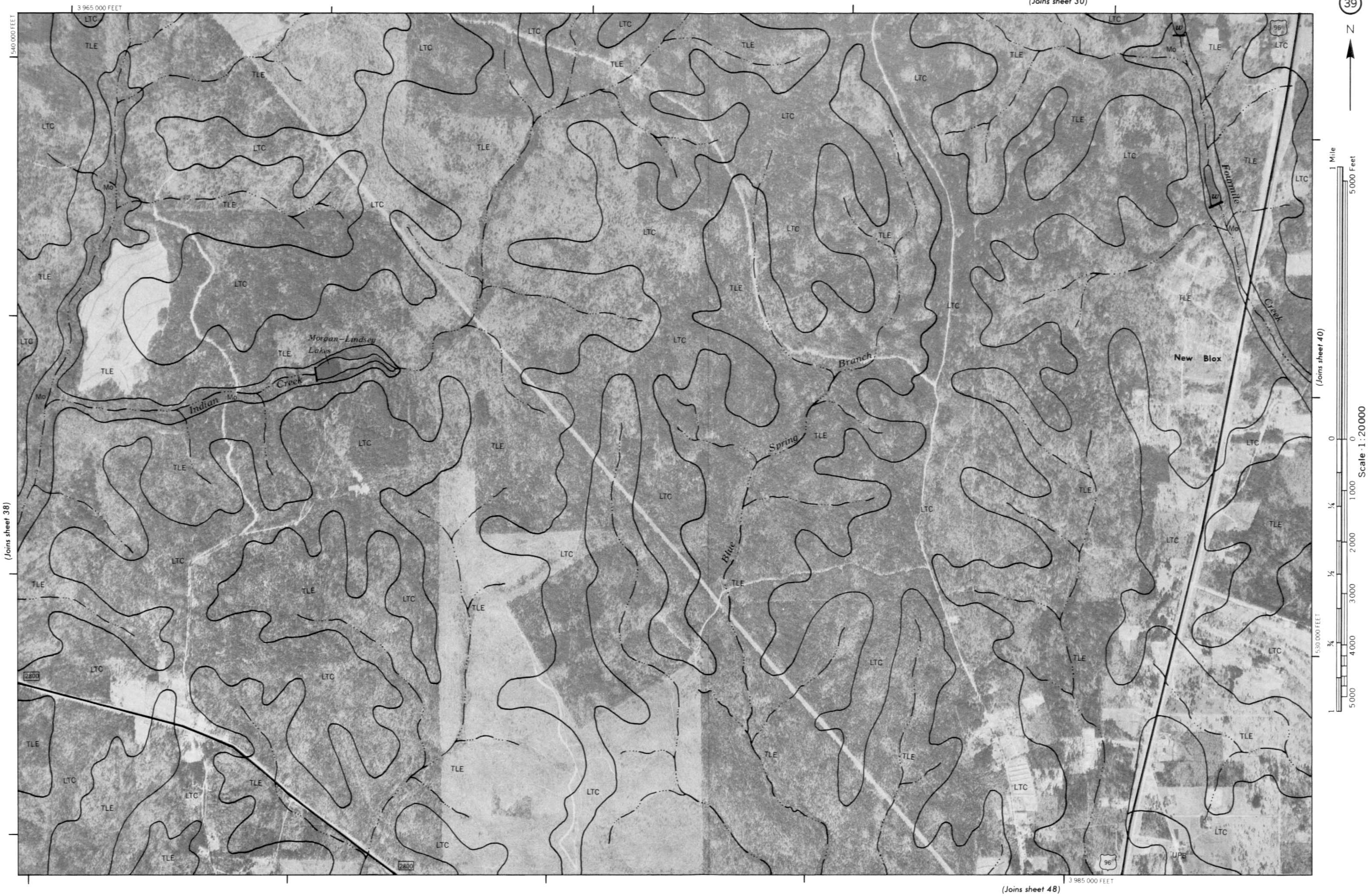

N
(Joins sheet 24)
(Joins sheet 35)
(Joins inset)
(Joins sheet 45)
(Joins upper right)
Scale 1:20000
1 Mile
5000 Feet
0
1000
2000
3000
4000
5000
¼
½
¾
1
4 130 000 FEET
565 000 FEET
560 000 FEET
550 000 FEET
4 115 000 FEET
4 136 000 FEET
4 135 000 FEET
563 000 FEET
63
Brack Creek
Mill Creek
Gray Hammock
Detty Creek
SABINE RIVER
VERNON PARISH LOUISIANA
Horseshoe Lake
Pine Bluff Lake
Catfish Lake
Gum Lake
Round Lake
water
Brushy Lake
Jarrels Ferry Lake
Wood Lake
NEB
TLE
Mo
DUB
LTC
NEE
BOE
WgC
BeB
De
Mr
Oc
BaB
BIB
SMB
SBE
Um
Mn
Iu
Gw

JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 37

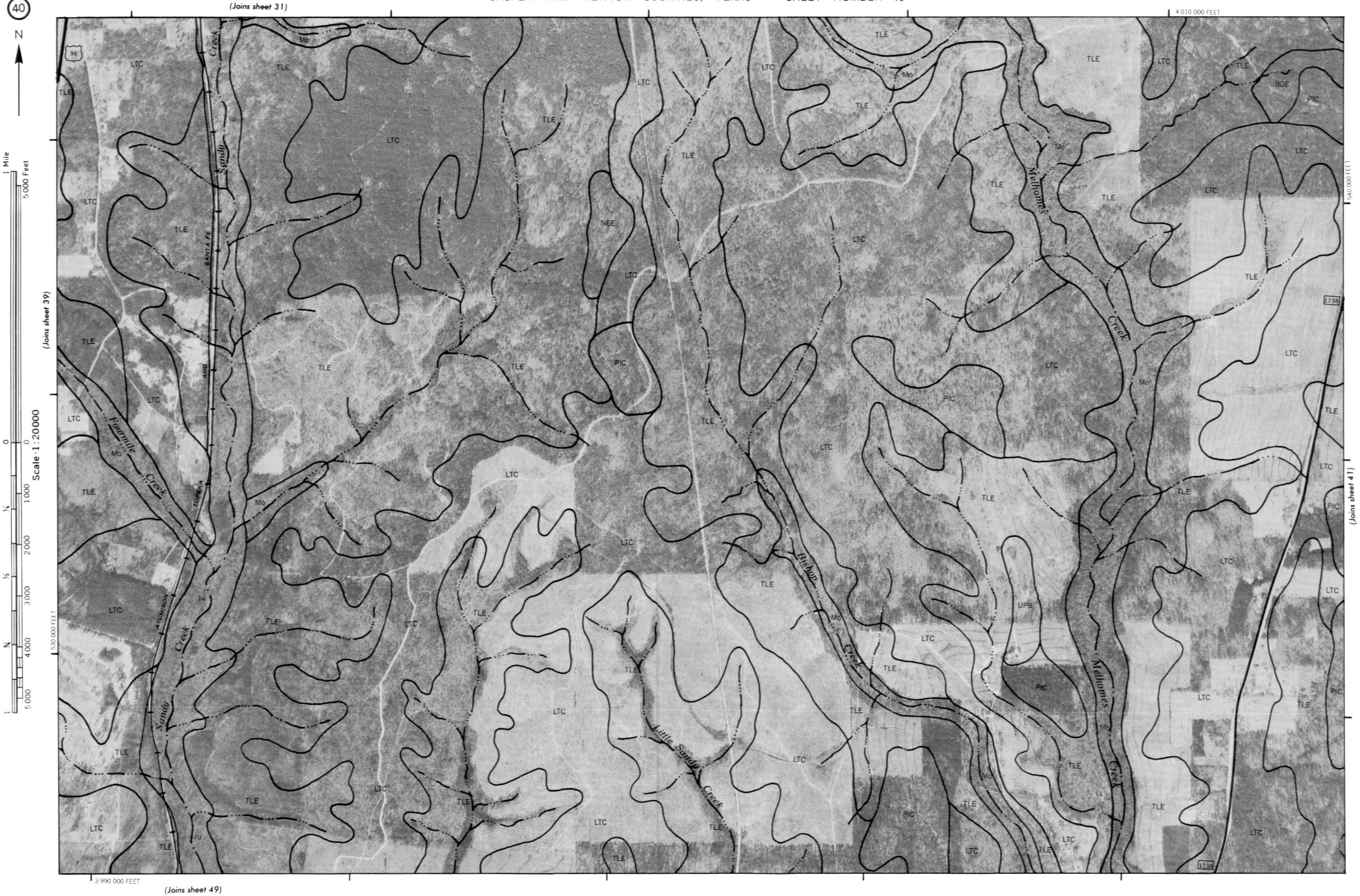


JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 38

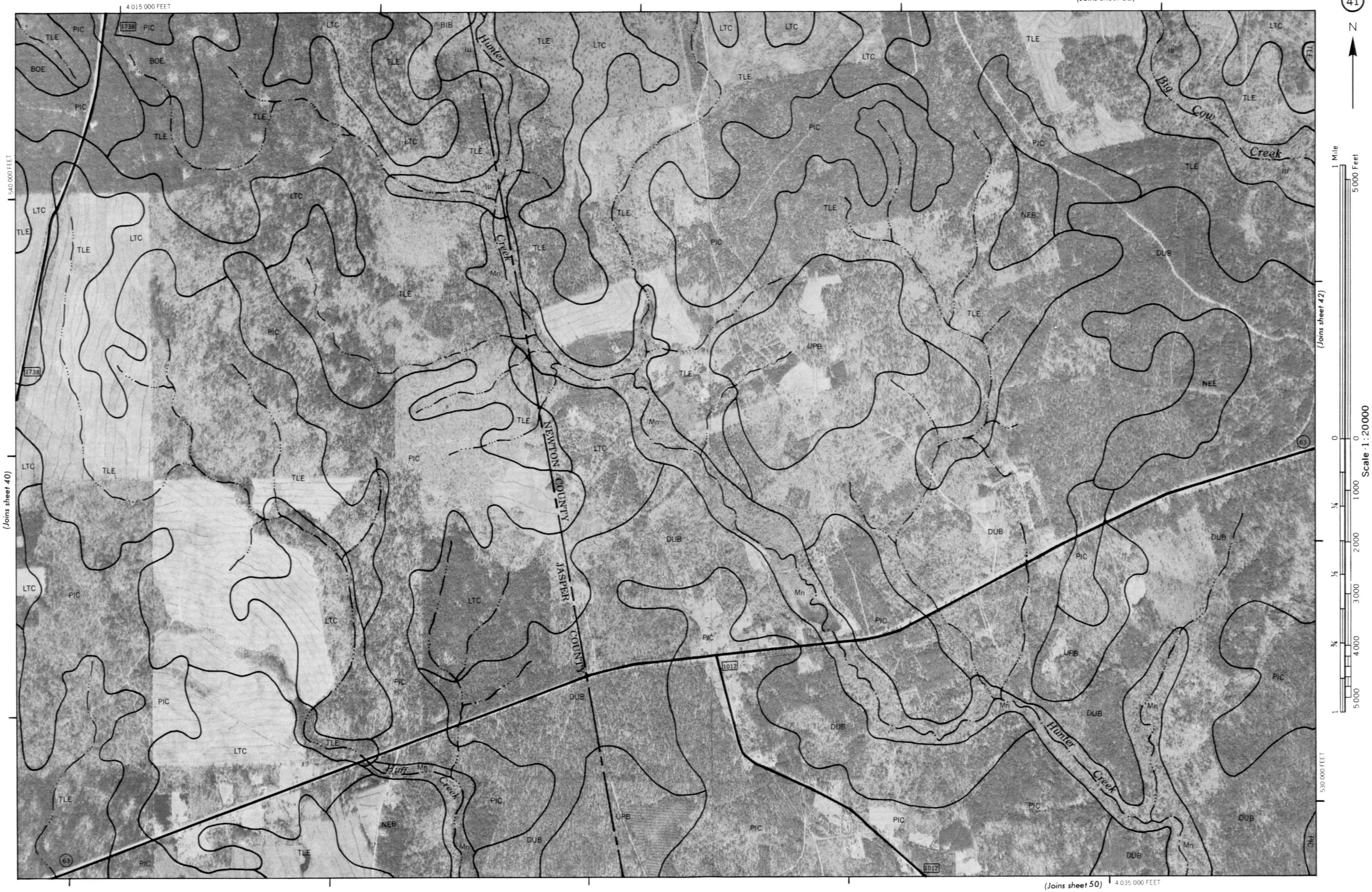



3 965 000 FEET
540 000 FEET
(Joins sheet 30)
(Joins sheet 38)
(Joins sheet 40)
(Joins sheet 48)
3 985 000 FEET
530 000 FEET
N
Morgan-Lindsey Lakes
Indian Creek
Blue Spring Branch
Fourmile Creek
New Blox
96
2800
LTC
TLE
Mo
UPB
w
1 Mile
5000 Feet
0
¼
½
¾
1
0
1000
2000
3000
4000
5000
Scale 1:20000

JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 40

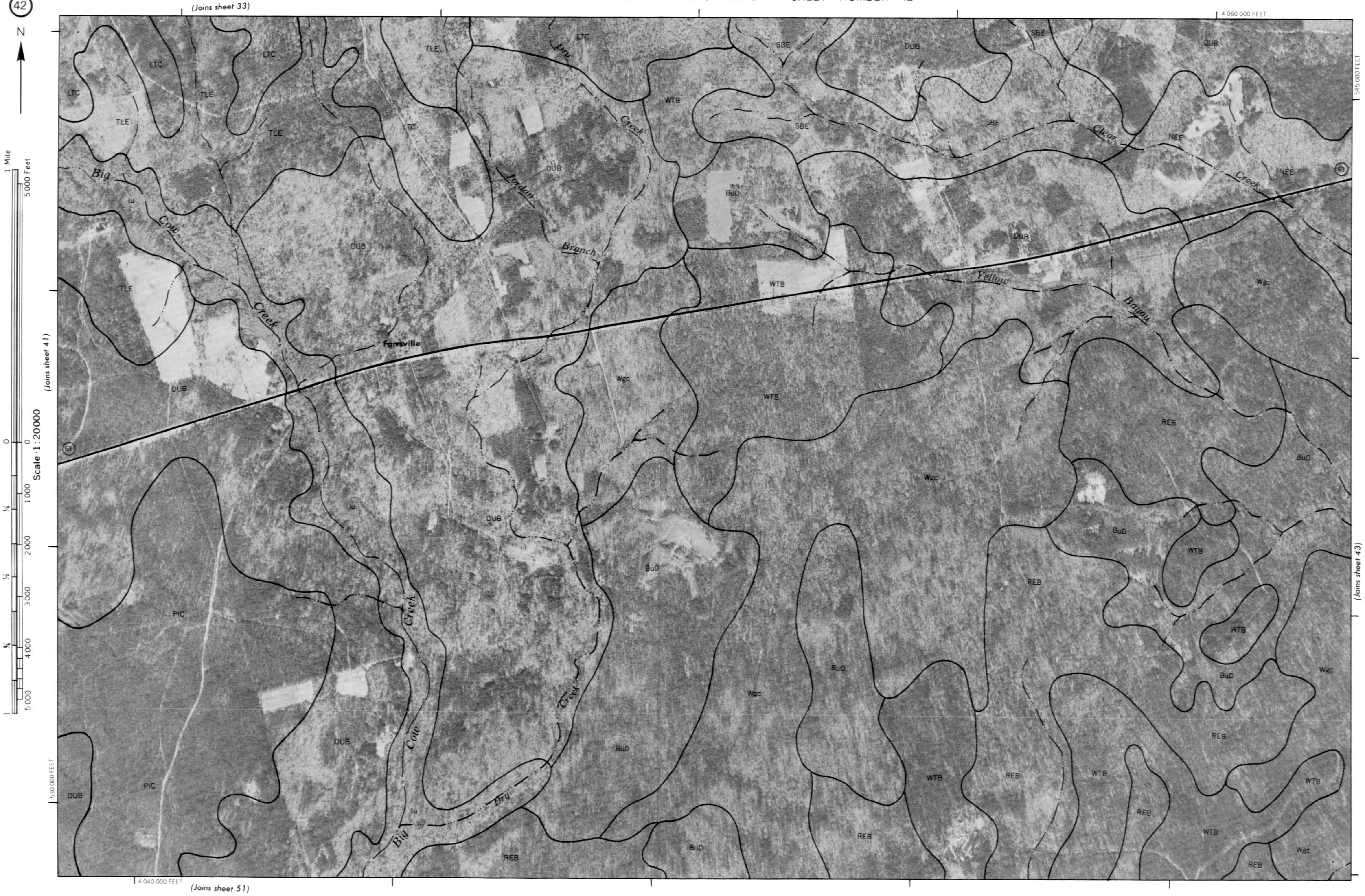


JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 41

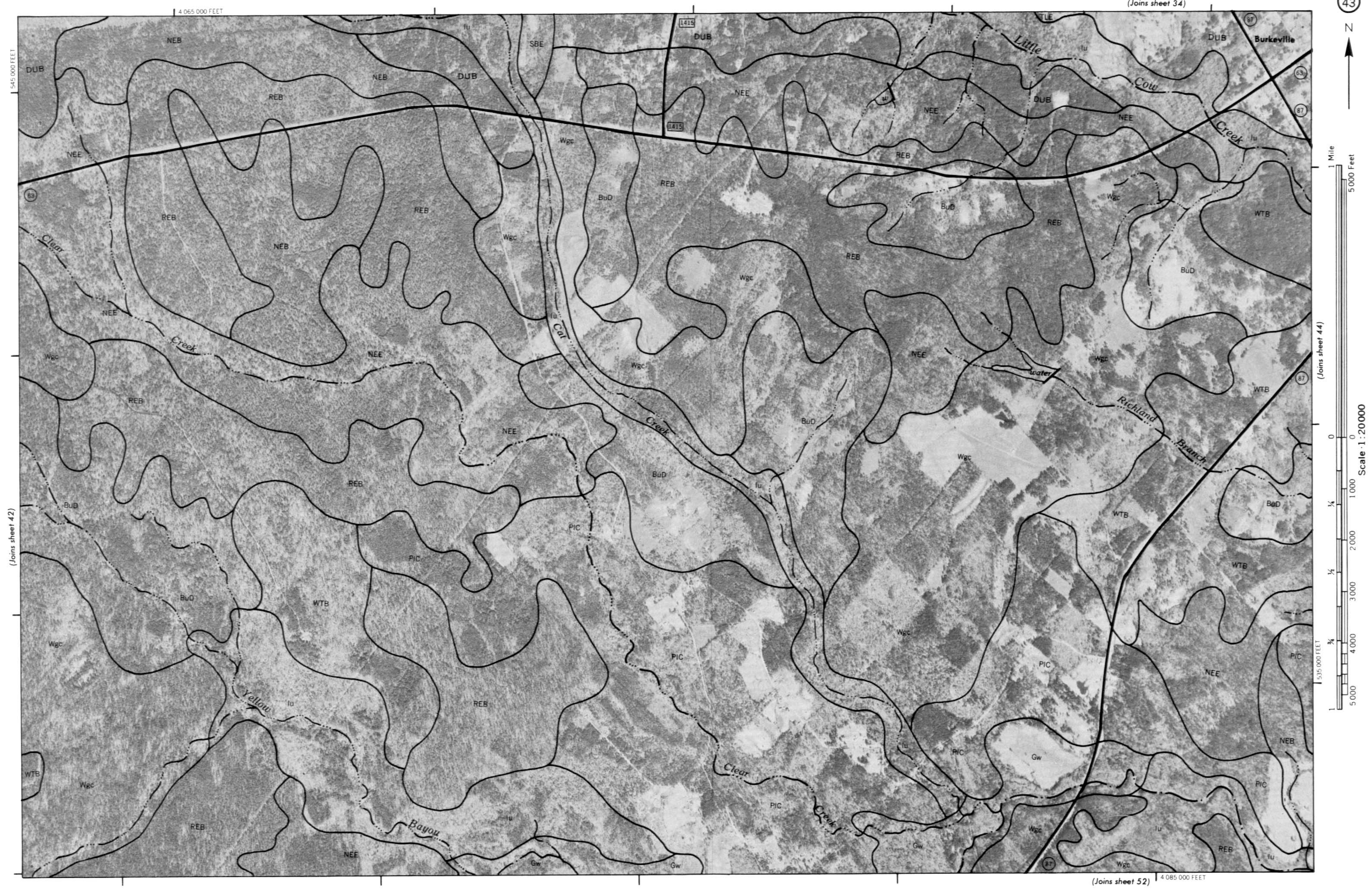


㊷

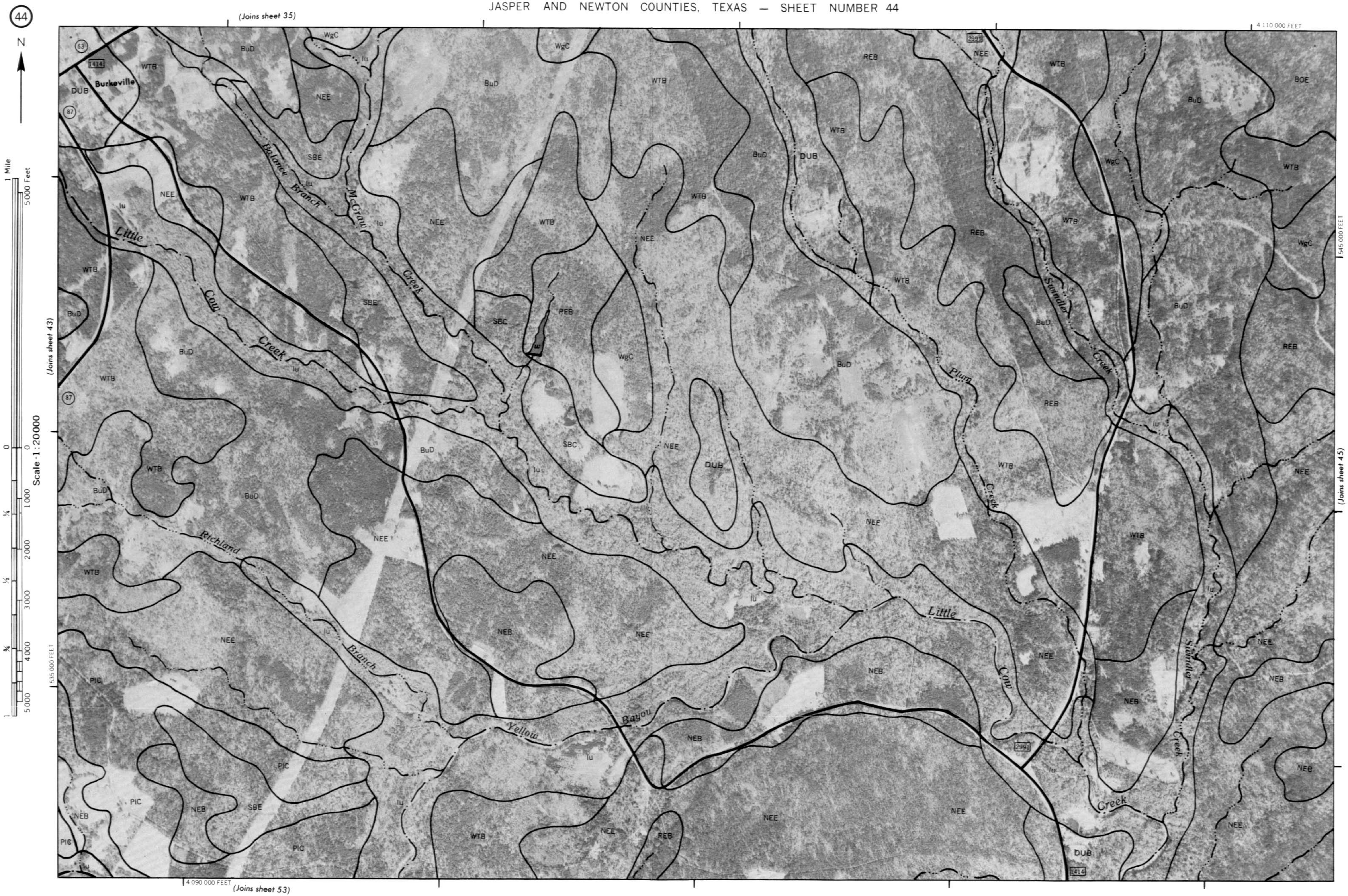
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 42

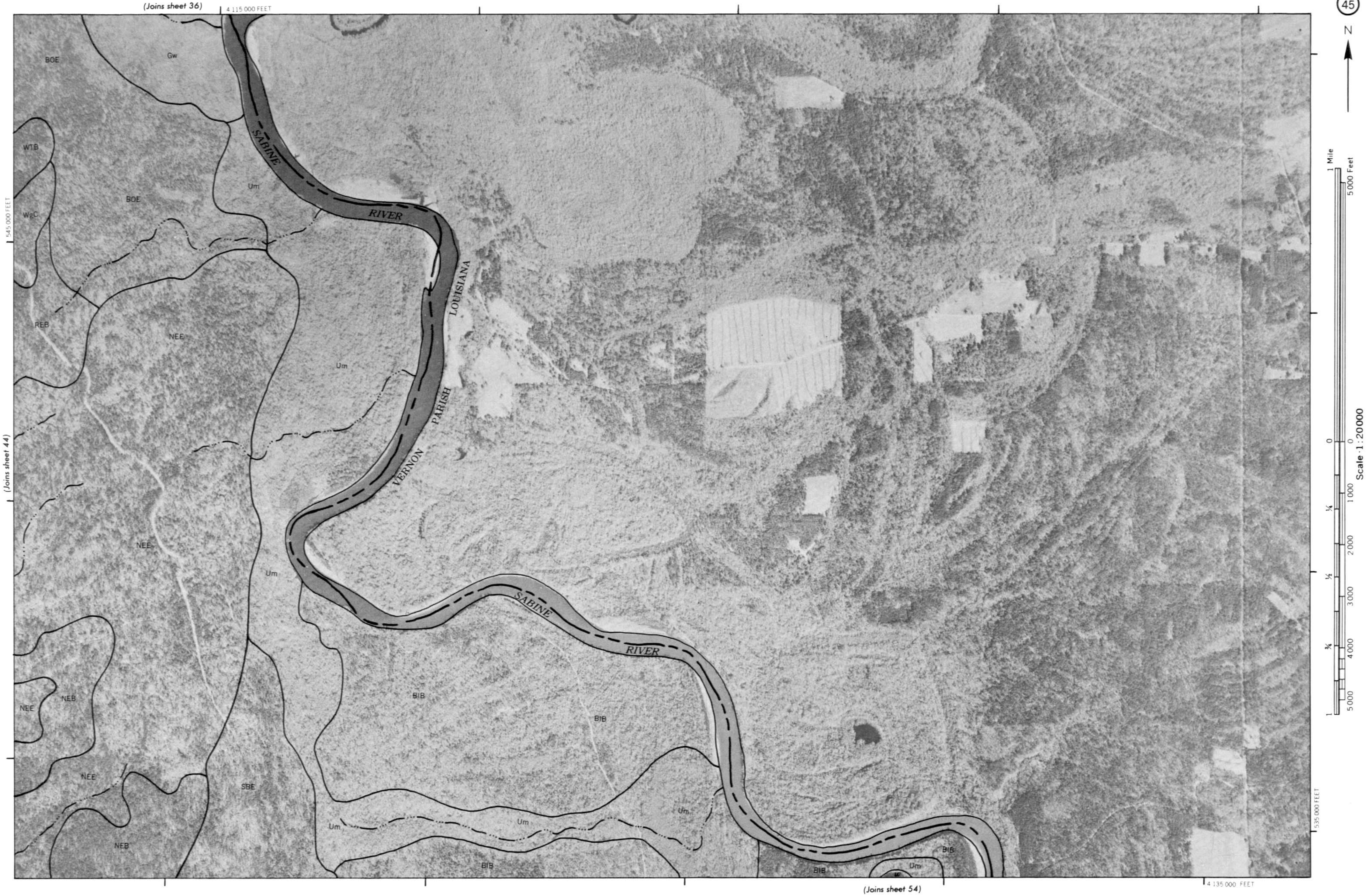


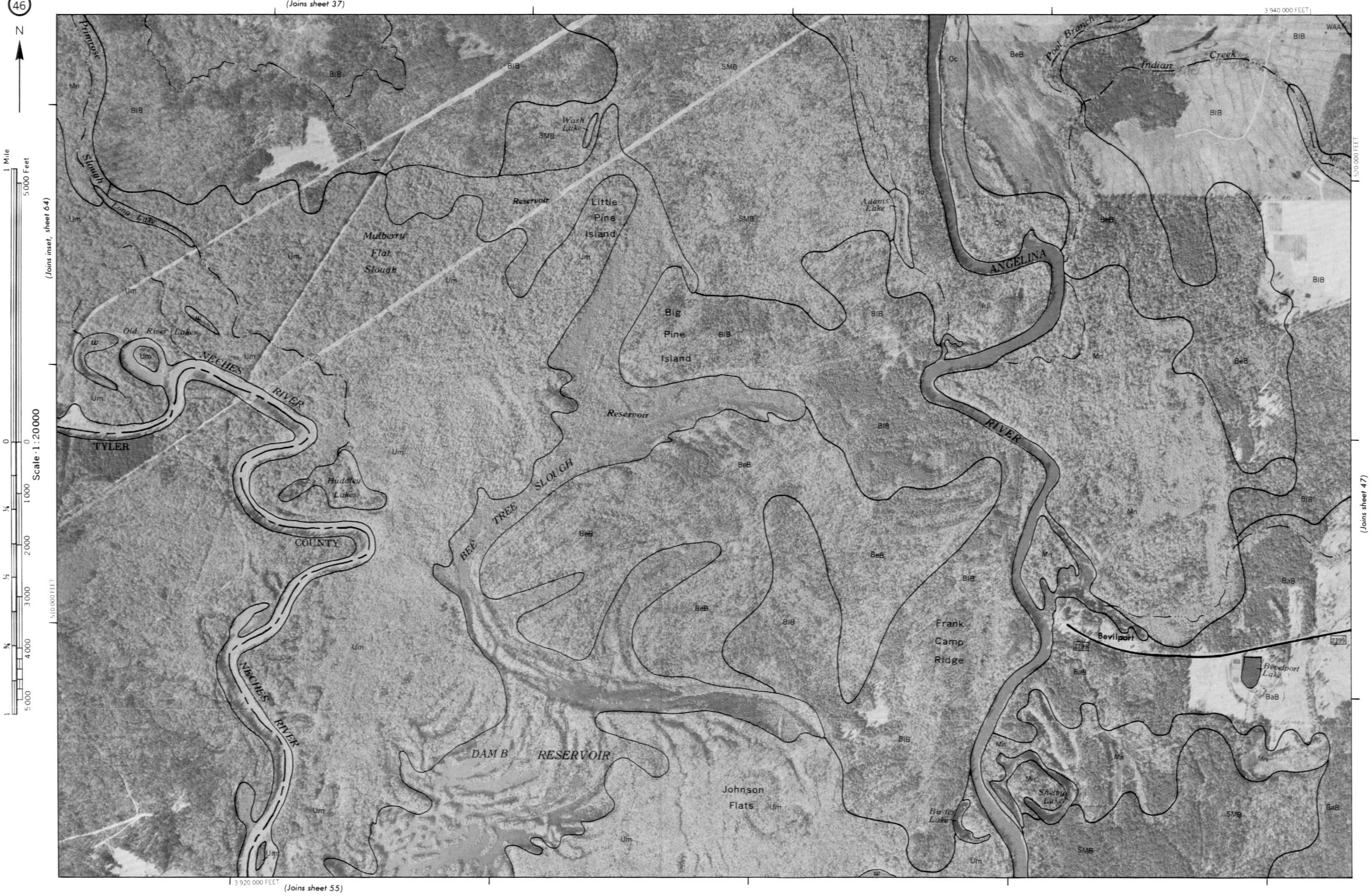
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 43



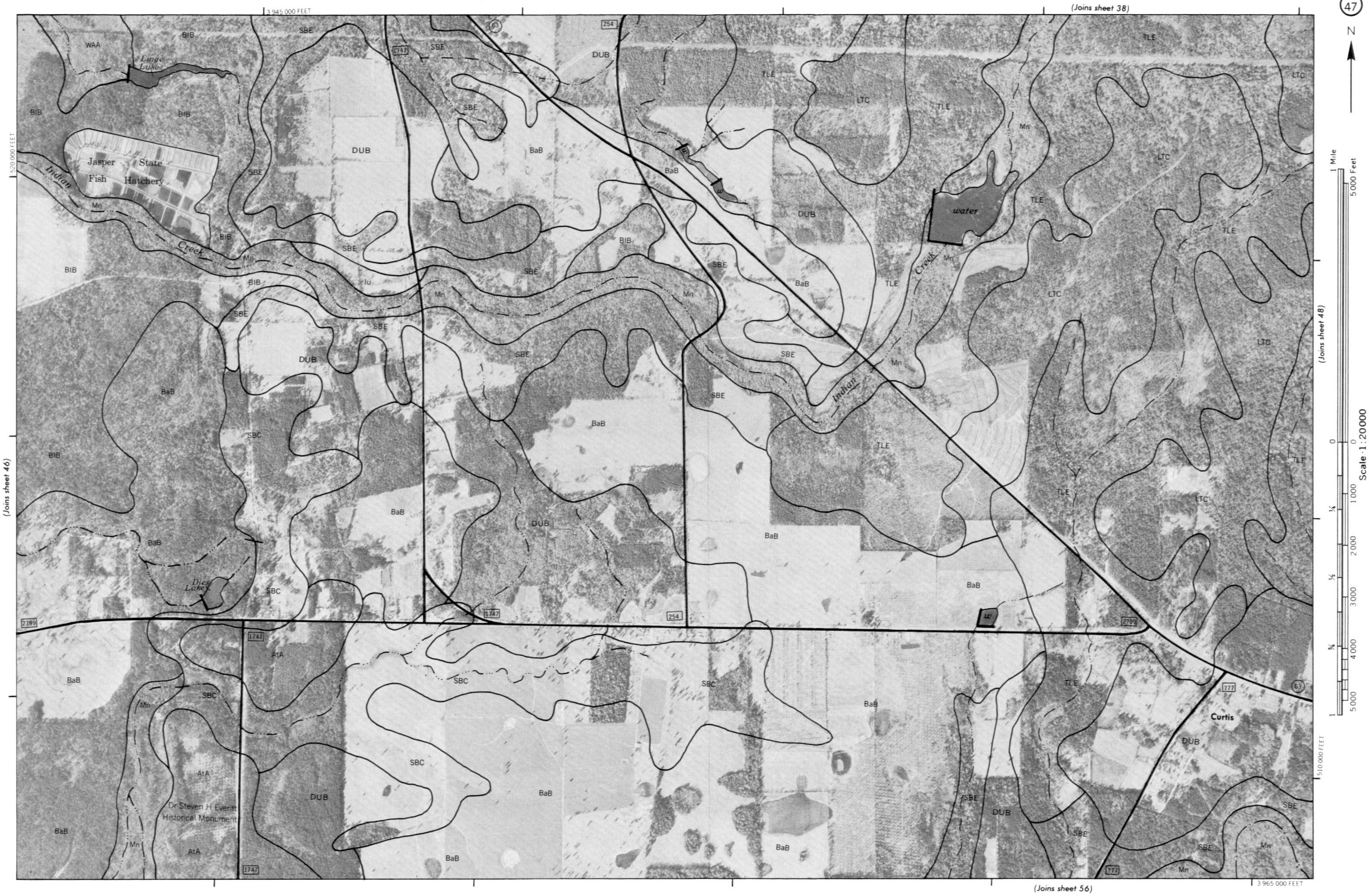
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 44



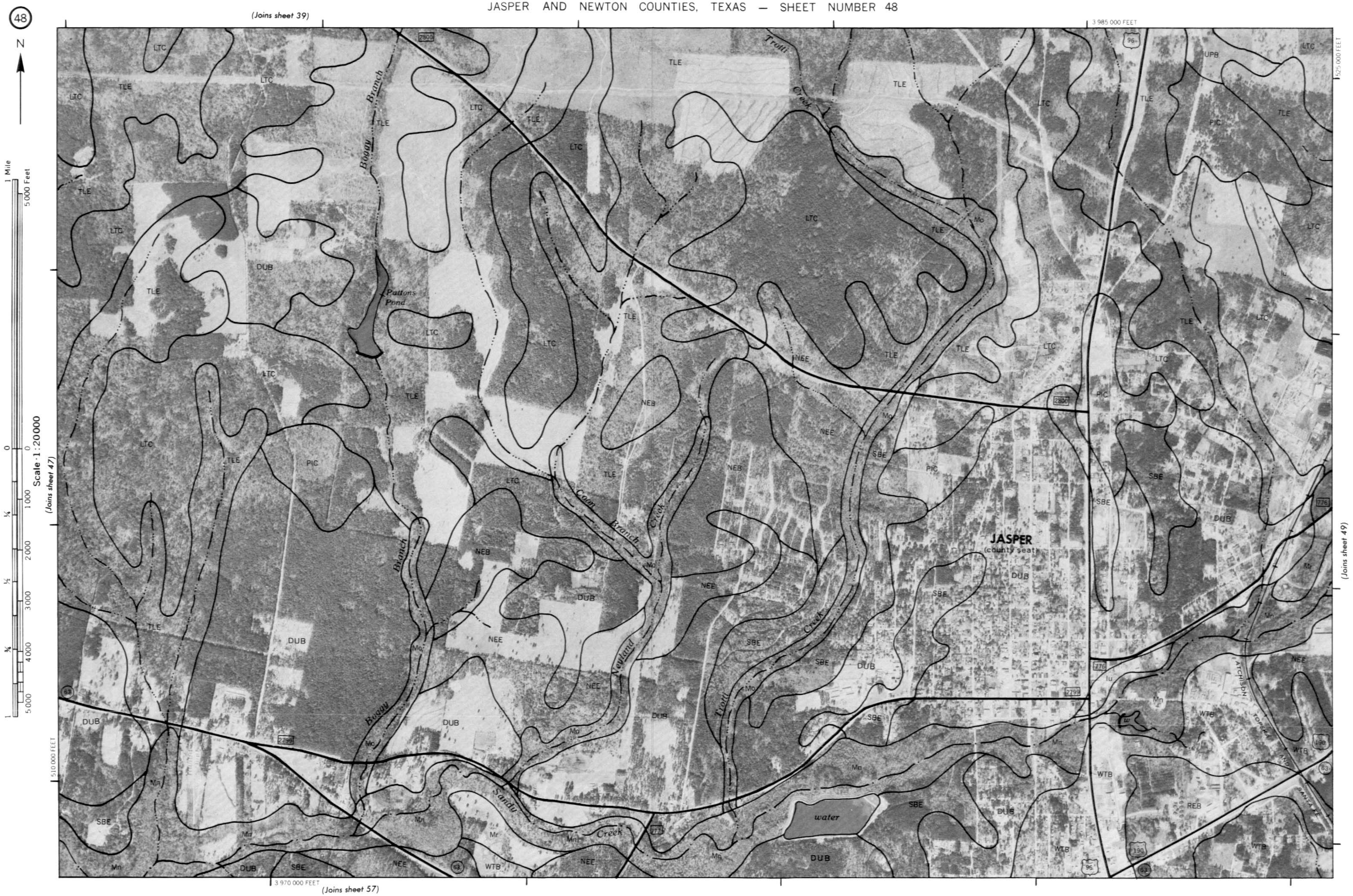

(Joins sheet 36)
4 115 000 FEET
545 000 FEET
(Joins sheet 44)
(Joins sheet 54)
4 135 000 FEET
535 000 FEET
N
BOE
Gw
WTB
WgC
BOE
Um
REB
NEE
Um
NEE
Um
NEE
NEB
NEE
SBE
NEB
BIB
BIB
Um
Um
Um
BIB
BIB
BIB
Um
w
SABINE
RIVER
LOUISIANA
PARISH
VERNON
SABINE
RIVER
1 Mile
5 000 Feet
0
¼
½
¾
1
0
1000
2000
3000
4000
5000
Scale 1:20000


(Joins sheet 37)
N
1 Mile
5000 Feet
Scale 1:20000
0
1000
2000
3000
4000
5000
¼
½
¾
1
(Joins inset, sheet 64)
(Joins sheet 47)
(Joins sheet 55)
3 940 000 FEET
520 000 FEET
510 000 FEET
3 920 000 FEET
Primrose
Slough
Long Lake
Old River Lakes
NECHES RIVER
TYLER
COUNTY
Huddley Lakes
Mulberry Flat Slough
Reservoir
Wash Lake
Little Pine Island
Big Pine Island
Reservoir
BEE TREE SLOUGH
DAM B RESERVOIR
Johnson Flats
Frank Camp Ridge
Adams Lake
ANGELINA RIVER
Pool Branch
Indian Creek
Bevilport
2799
Bevelport Lake
Shelby Lake
Buster Lake
W
Mn
BlB
Um
SMB
BeB
Iu
Oc
BaB
WAA

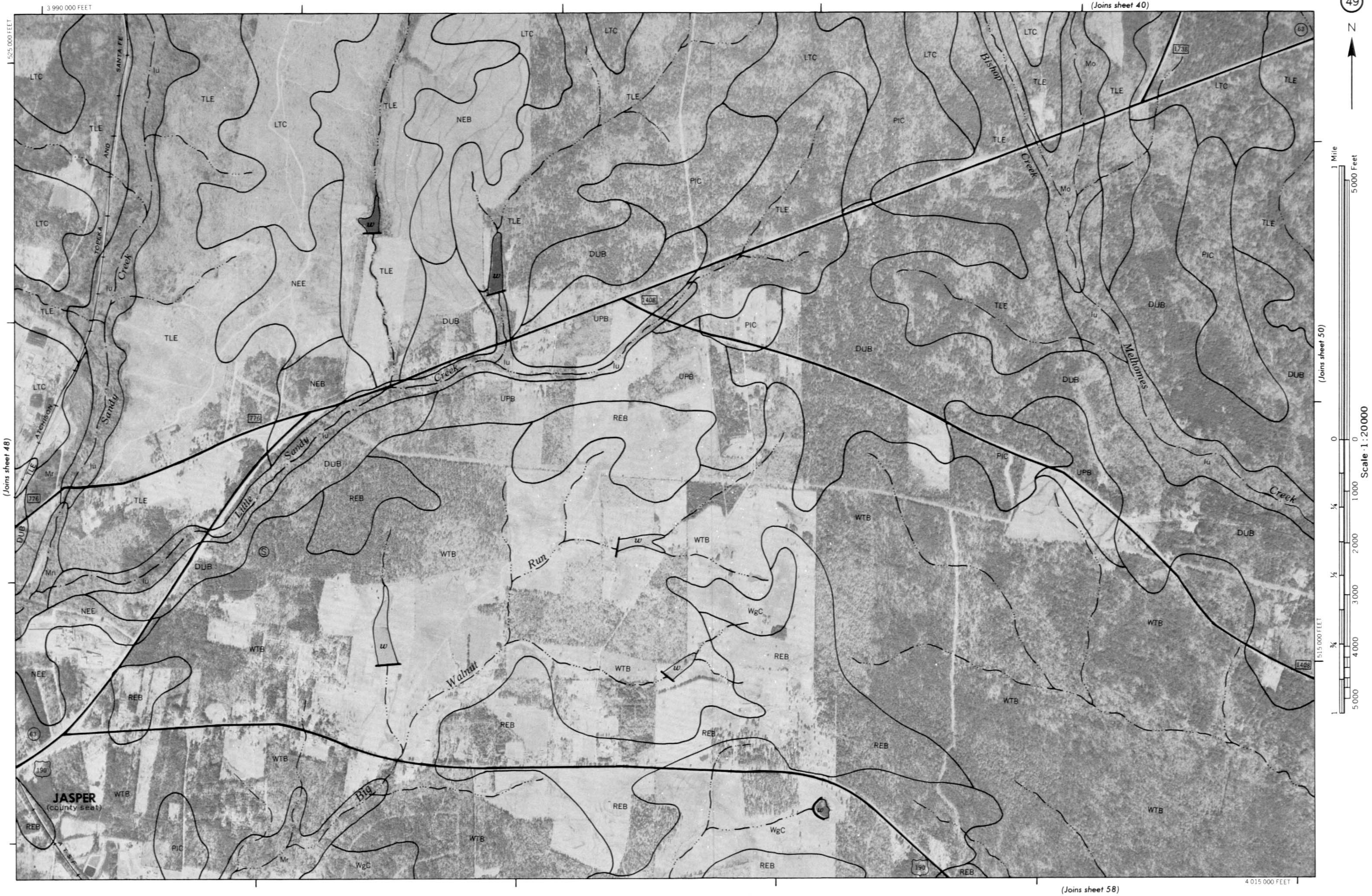
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 47



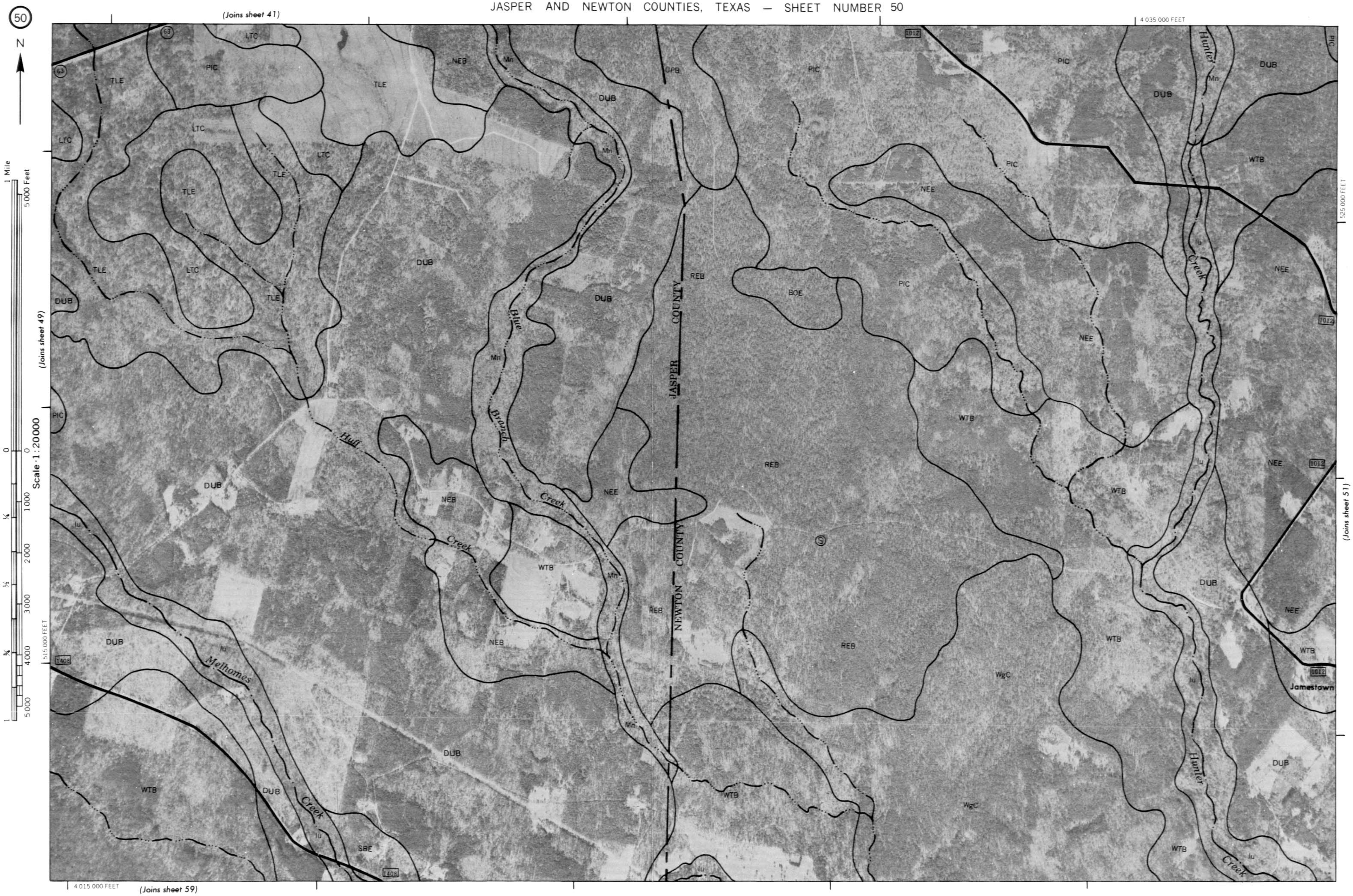
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 48



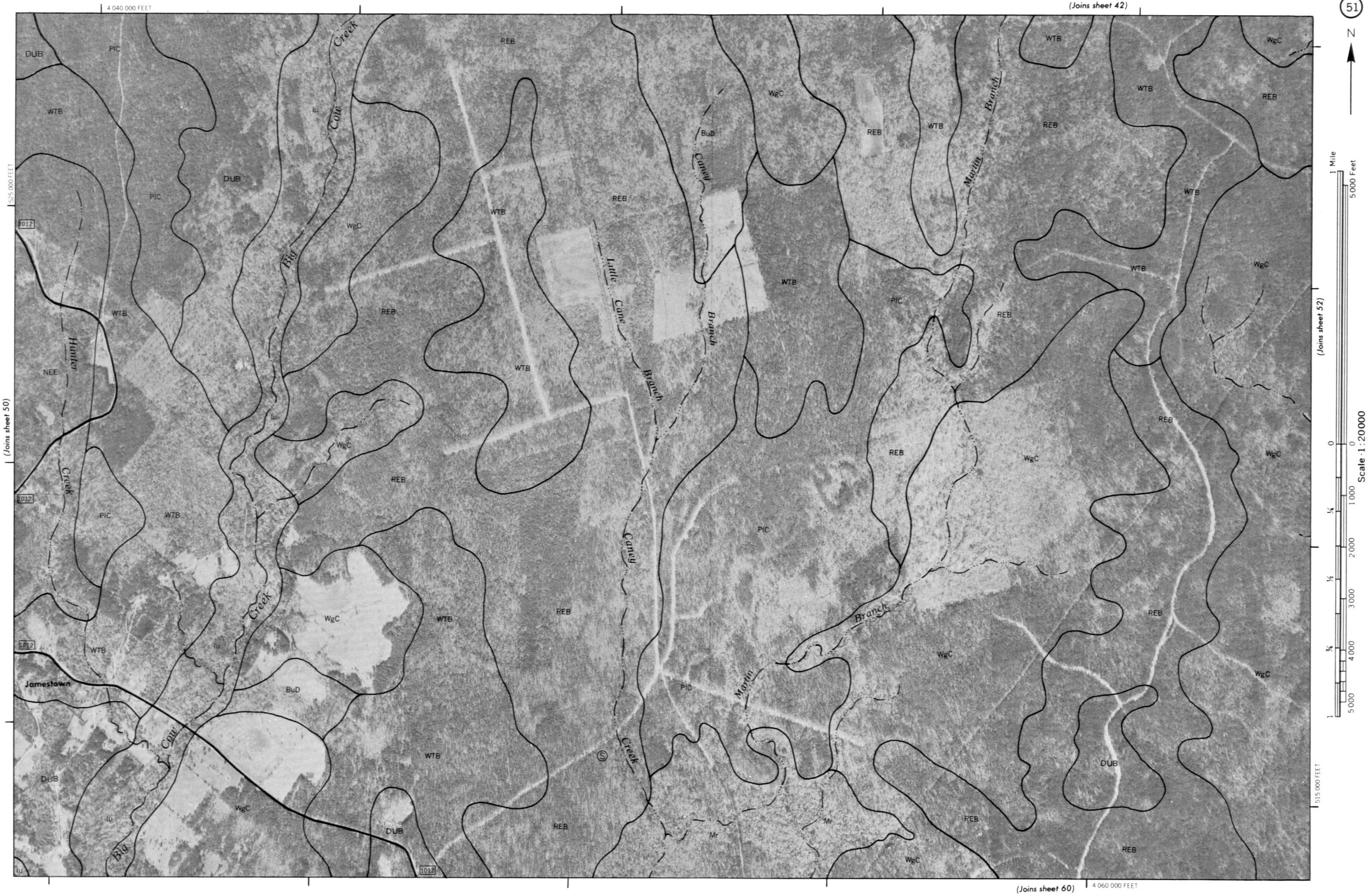
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 49



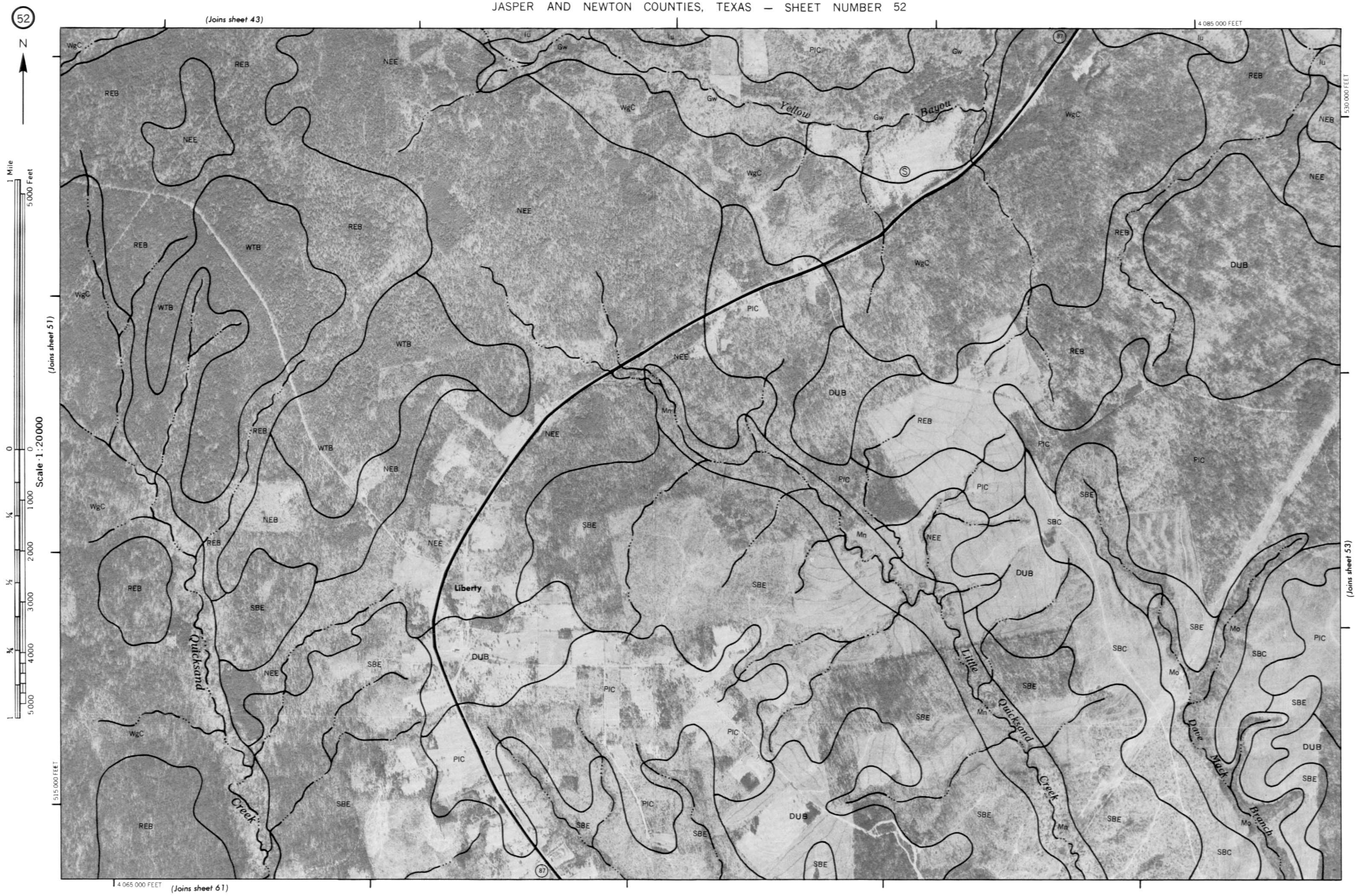
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 50

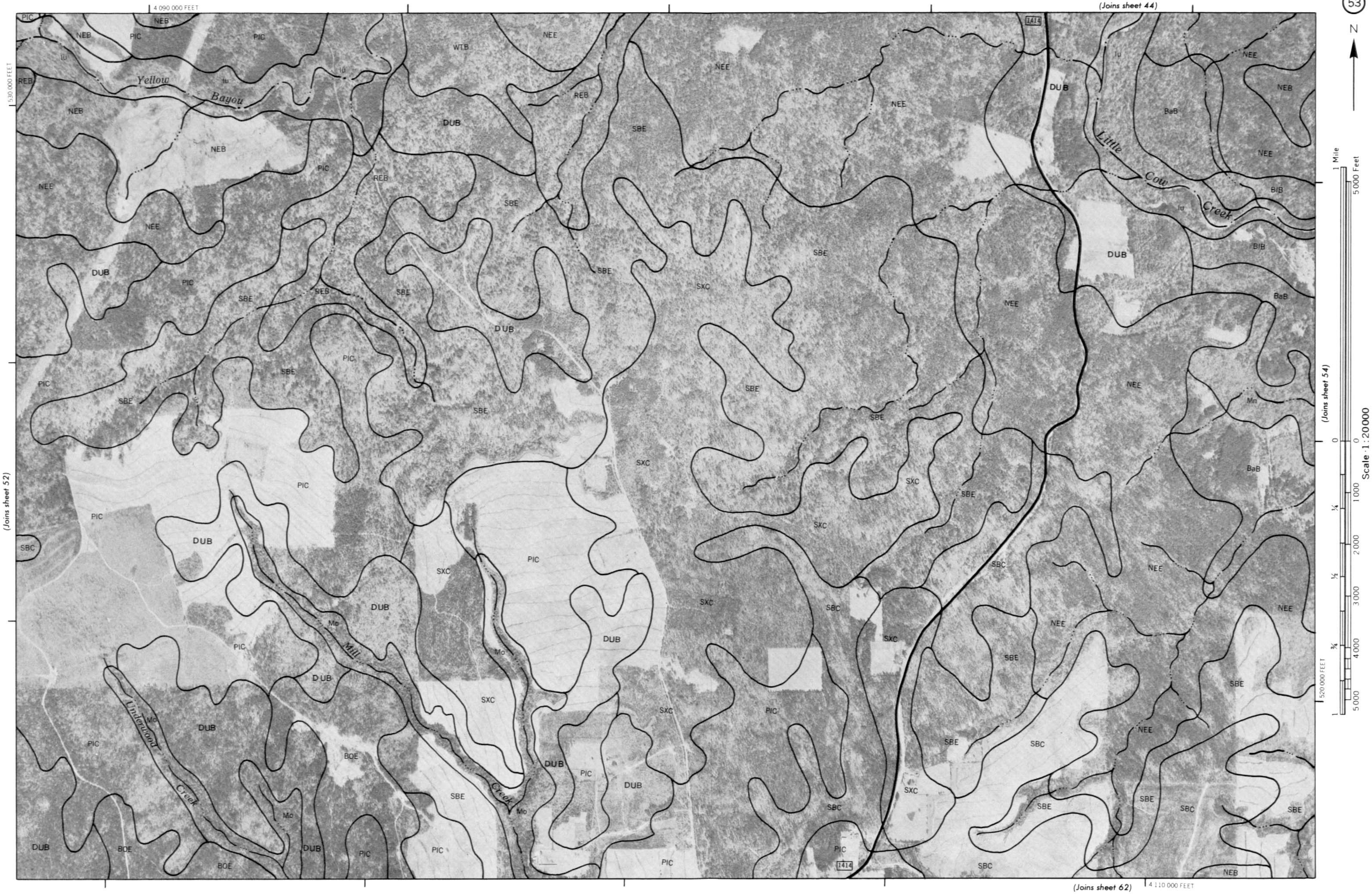


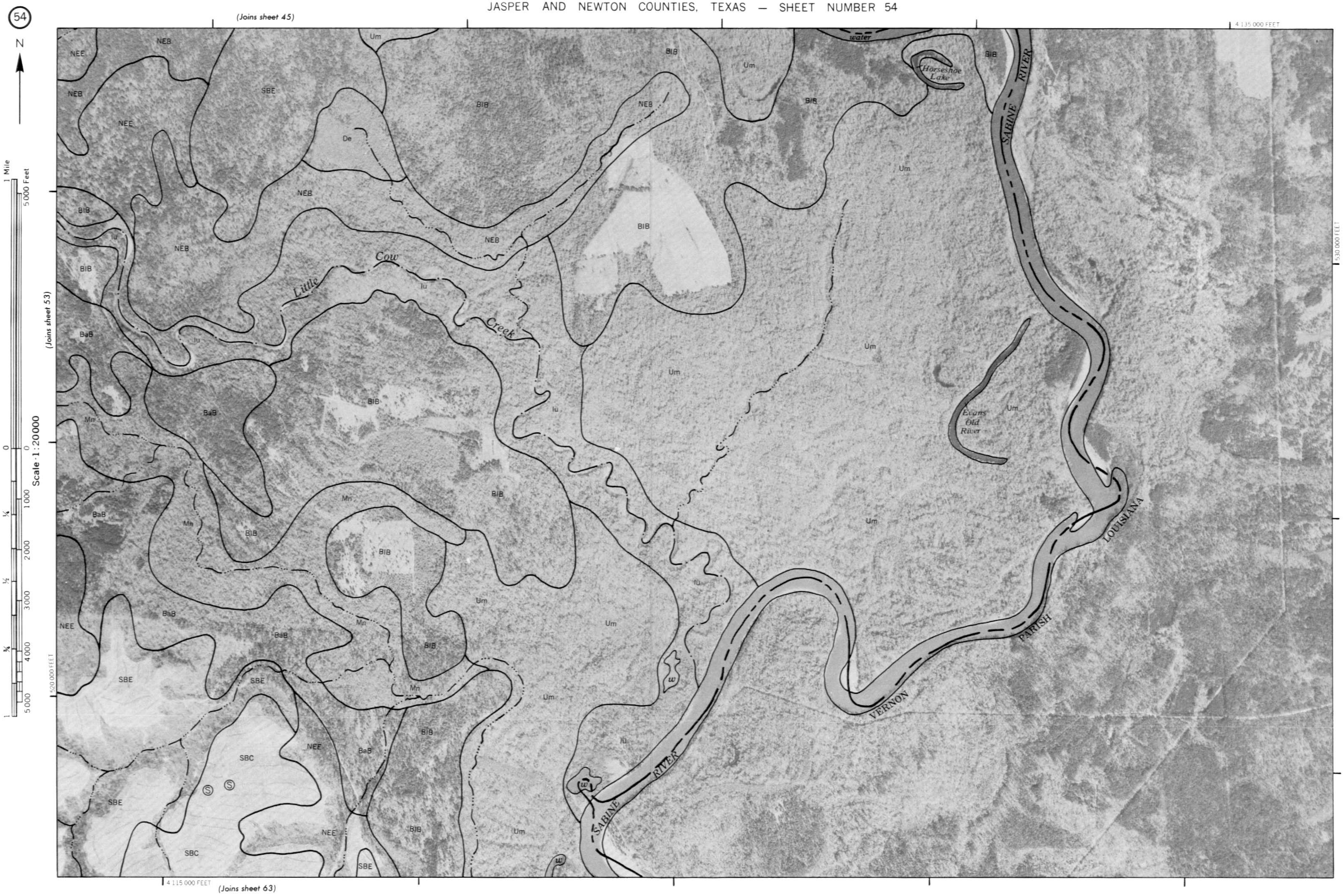
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 51

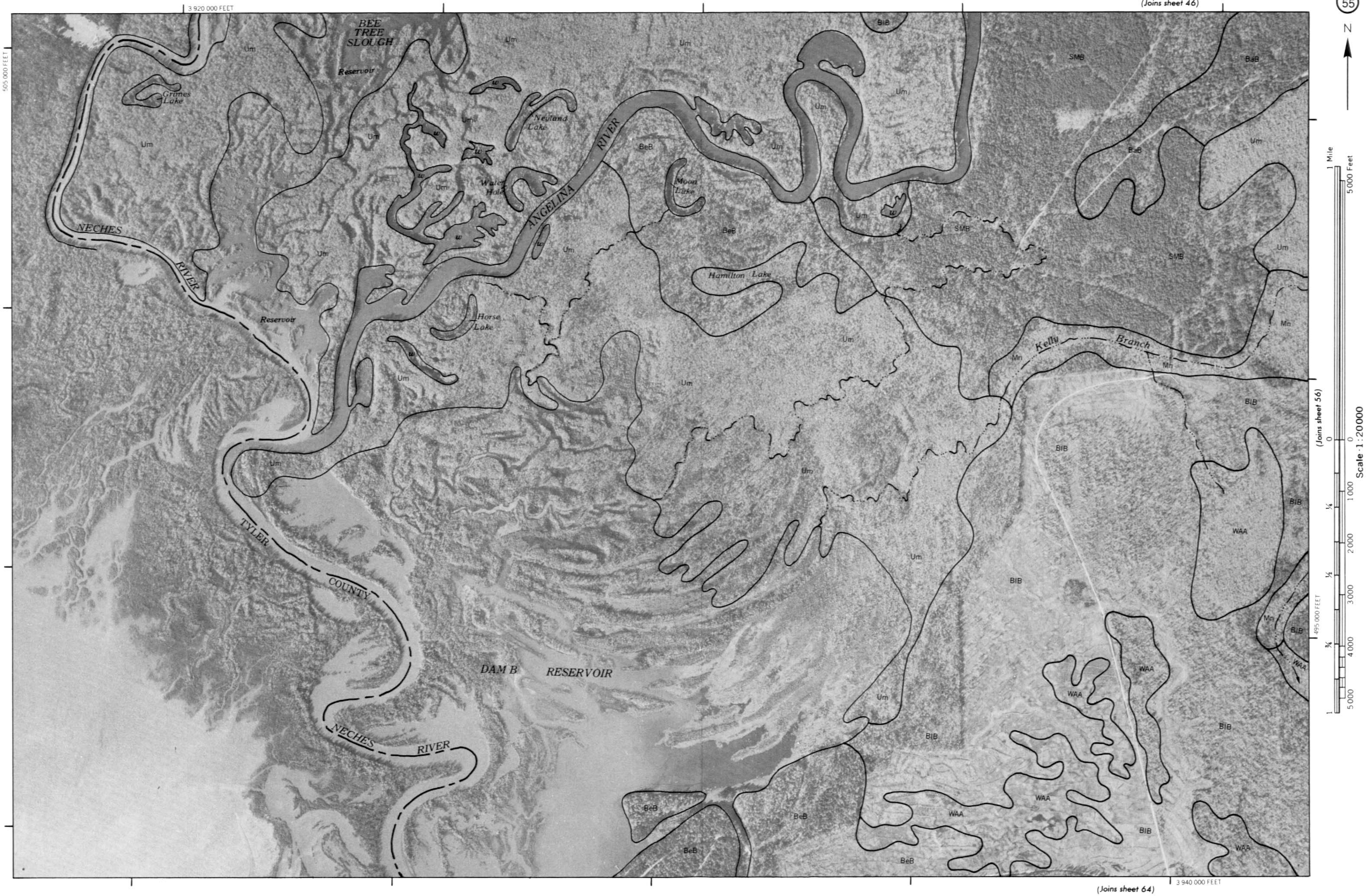


JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 52



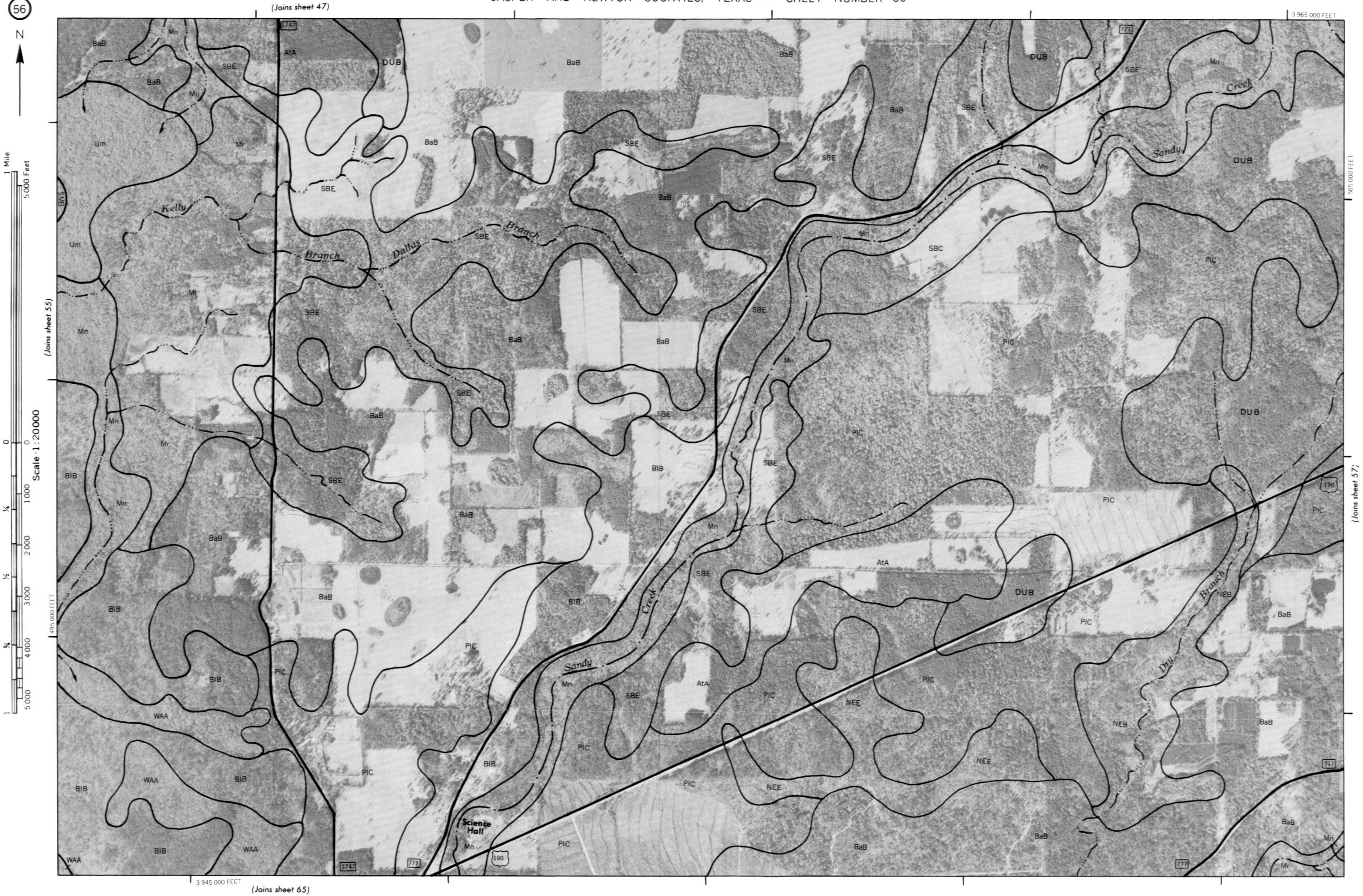

4 090 000 FEET
(Joins sheet 44)
530 000 FEET
(Joins sheet 52)
(Joins sheet 54)
(Joins sheet 62)
4 110 000 FEET
520 000 FEET
N
1 Mile
5000 Feet
Scale 1:20 000
0
¼
½
¾
1
1000
2000
3000
4000
5000
Yellow Bayou
Little Cow Creek
Mill Creek
Underwood Creek
1414
PIC
NEB
Iu
REB
WTB
NEE
DUB
SBE
SXC
BaB
BIB
Mn
SBC
Mo
BOE

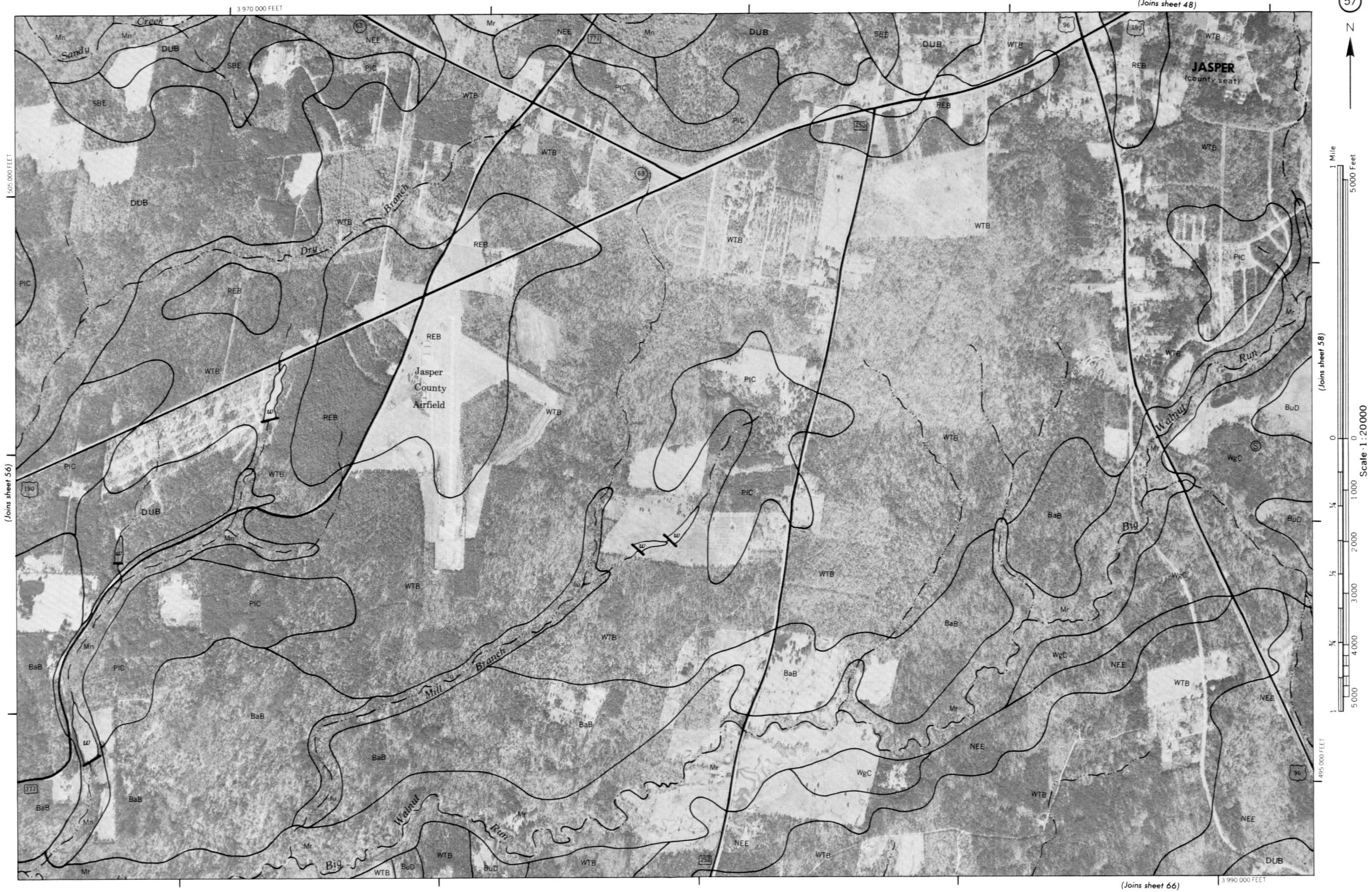

54
N
(Joins sheet 45)
(Joins sheet 53)
(Joins sheet 63)
4 135 000 FEET
4 115 000 FEET
530 000 FEET
520 000 FEET
Scale 1:20000
1 Mile
5 000 Feet
0
1000
2000
3000
4000
5000
¼
½
¾
1
NEE
NEB
SBE
BIB
Um
De
BaB
Iu
Mn
SBC
NEE
water
Horseshoe Lake
SABINE RIVER
Little Cow Creek
Evans Old River
LOUISIANA
PARISH
VERNON
w
S


3 920 000 FEET
(Joins sheet 46)
505 000 FEET
BEE TREE SLOUGH
Reservoir
Grimes Lake
Neuland Lake
Water Hole
Moon Lake
Hamilton Lake
Horse Lake
ANGELINA RIVER
NECHES RIVER
Reservoir
TYLER COUNTY
NECHES RIVER
DAM B RESERVOIR
Kelly Branch
Um
w
BeB
BlB
SMB
BaB
Mn
WAA
(Joins sheet 56)
495 000 FEET
3 940 000 FEET
(Joins sheet 64)
N
1 Mile
5000 Feet
0
¼
½
¾
1
1000
2000
3000
4000
5000
Scale 1:20000

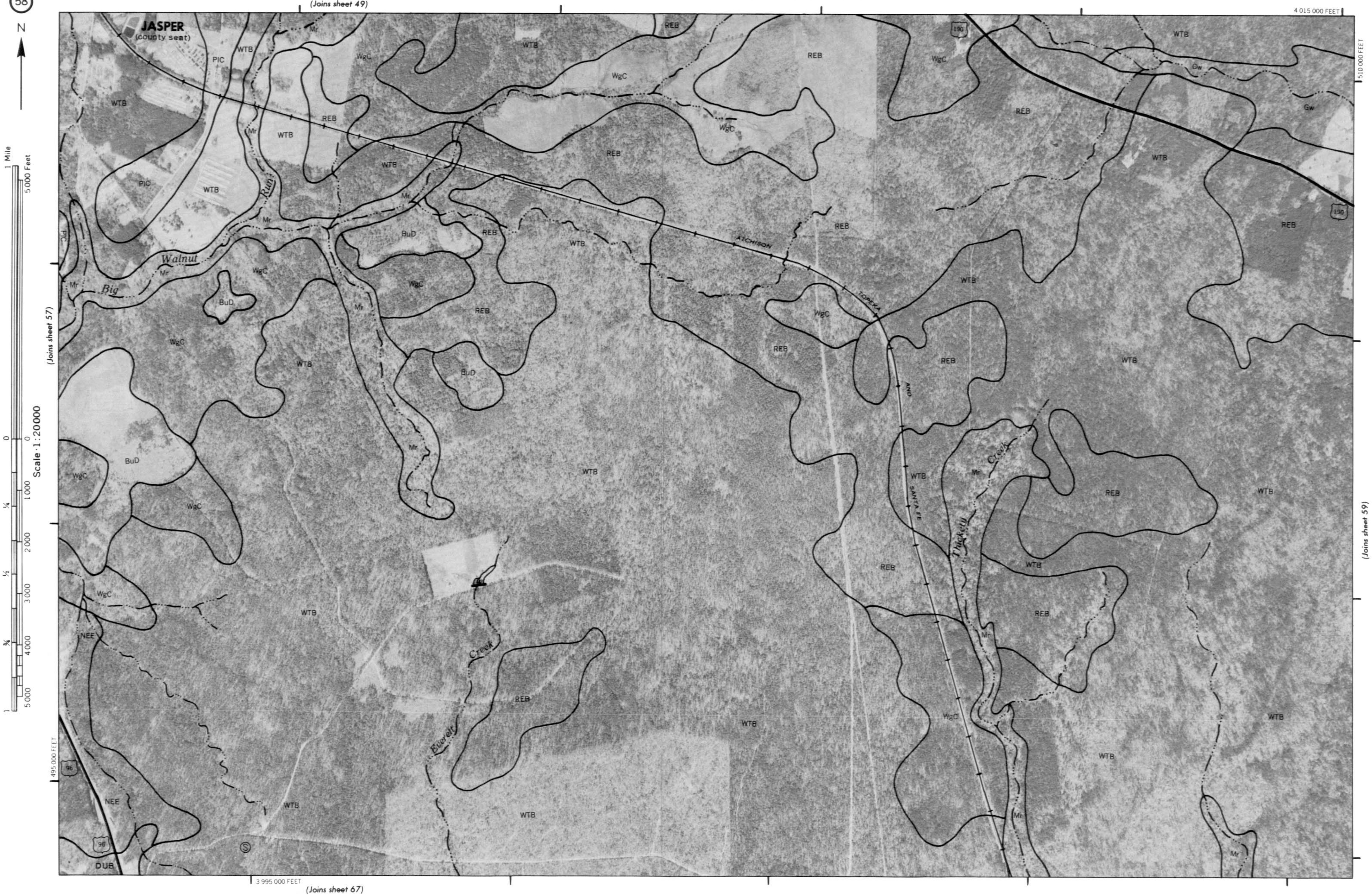
56

JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 56

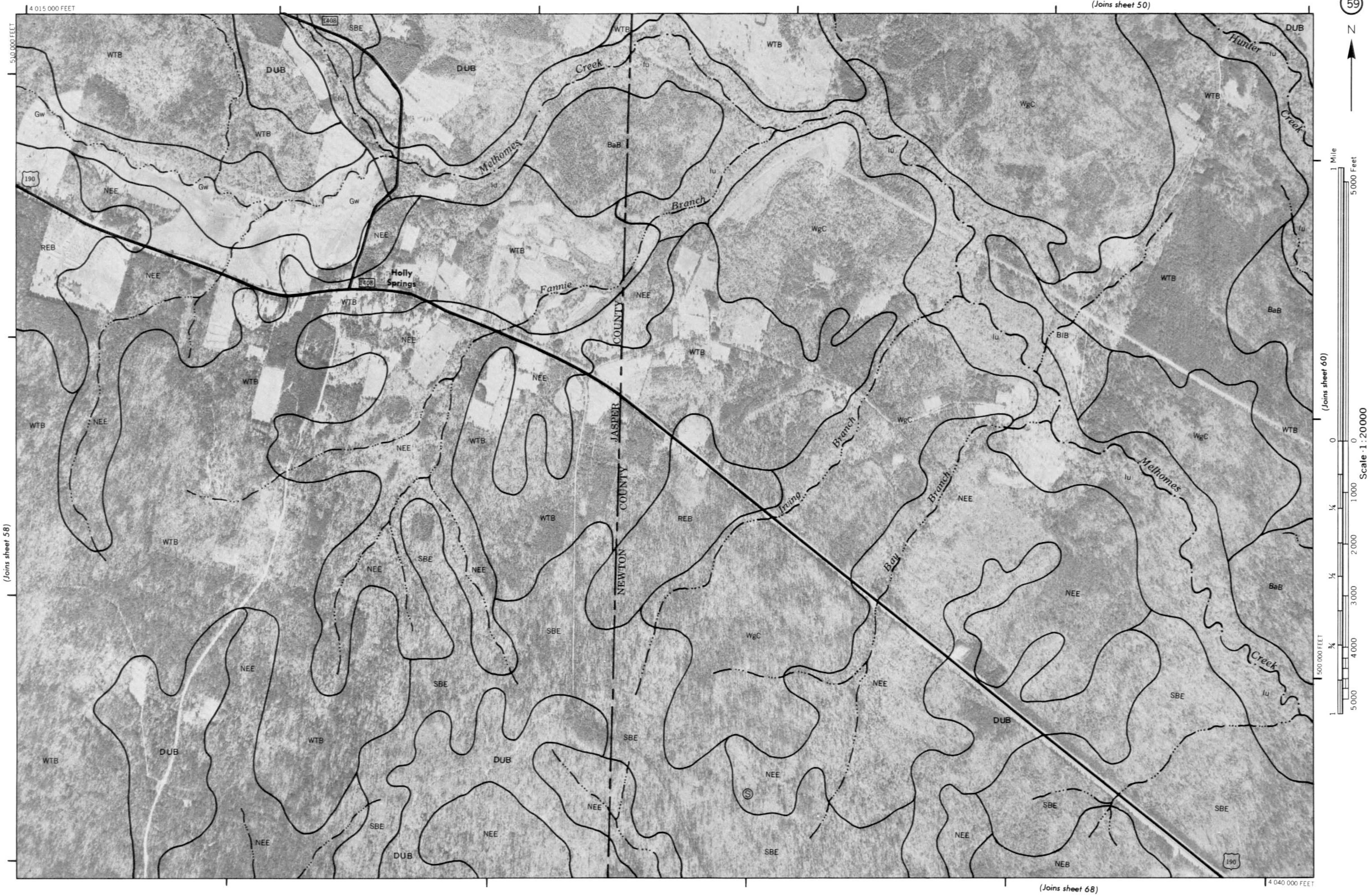



3 970 000 FEET
(Joins sheet 48)
505 000 FEET
(Joins sheet 56)
(Joins sheet 58)
495 000 FEET
3 990 000 FEET
(Joins sheet 66)
N
1 Mile
5 000 Feet
0
¼
½
¾
1
1000
2000
3000
4000
5000
Scale 1:20000
JASPER
(county seat)
Jasper
County
Airfield
Sandy
Creek
Dry
Branch
Mill
Branch
Big
Walnut
Run
63
777
96
190
252
Mn
DUB
SBE
NEE
Mr
PIC
WTB
REB
w
BaB
BuD
WgC
Mr

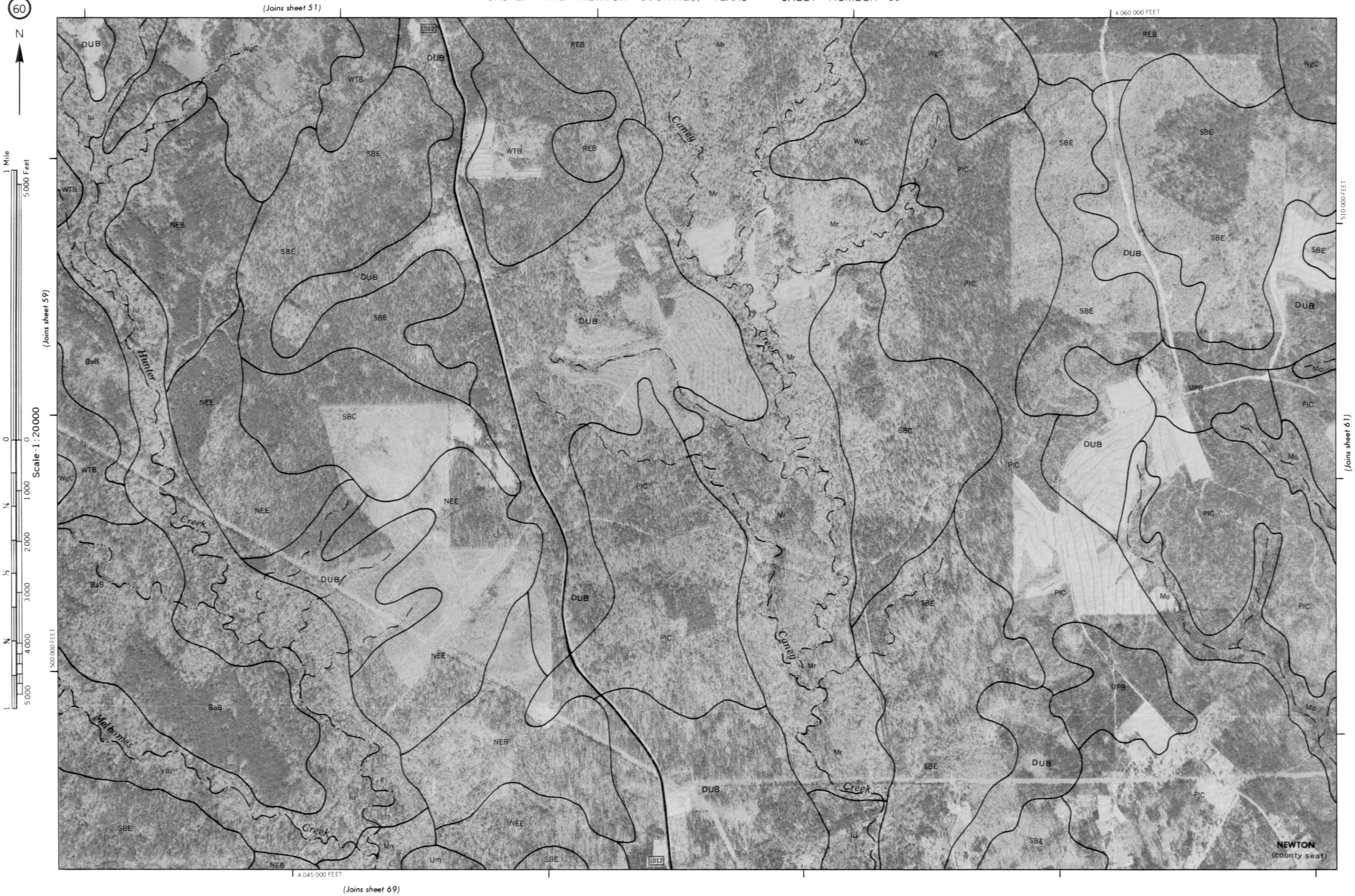
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 58



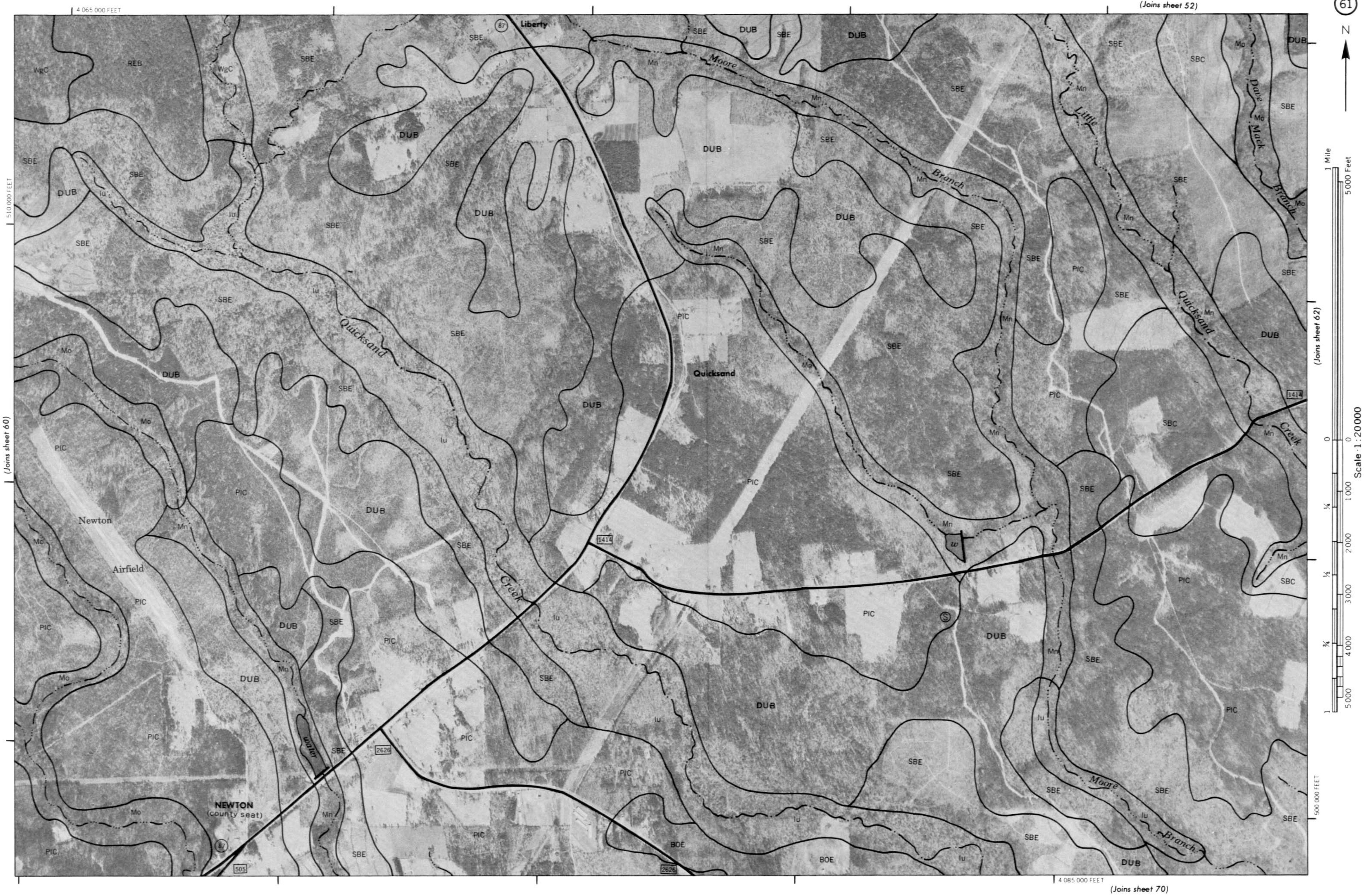
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 59



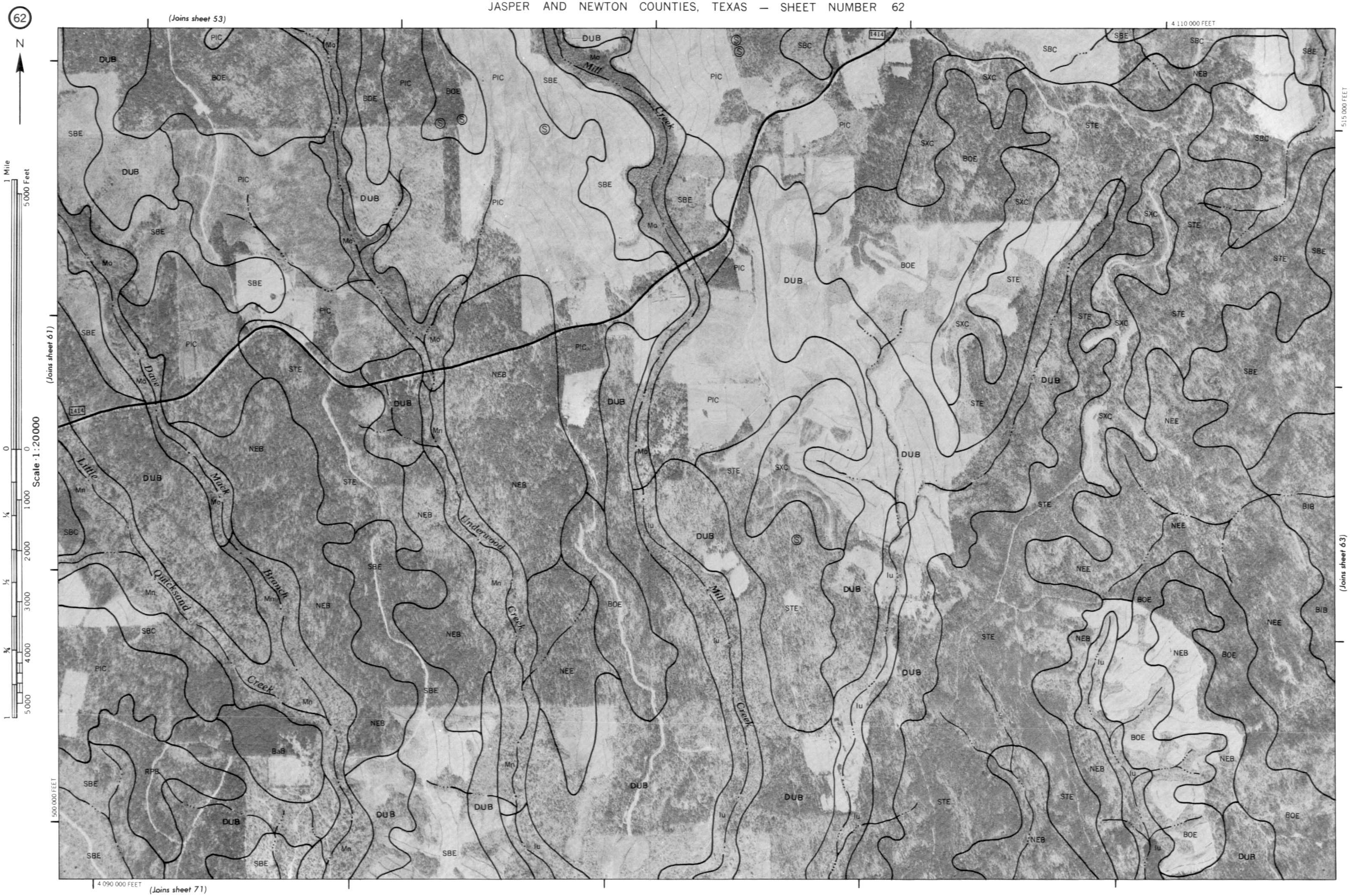
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 60



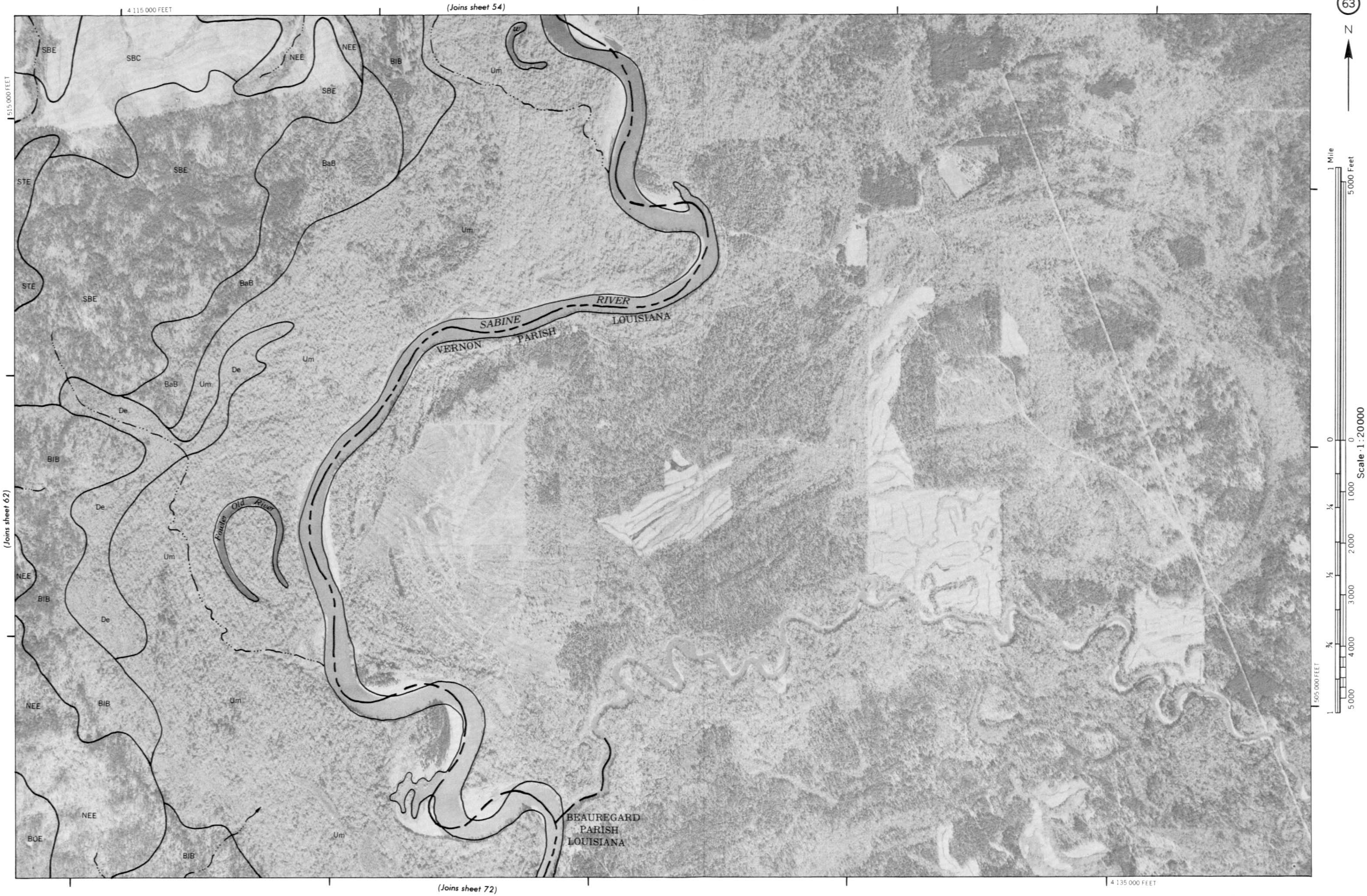
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 61

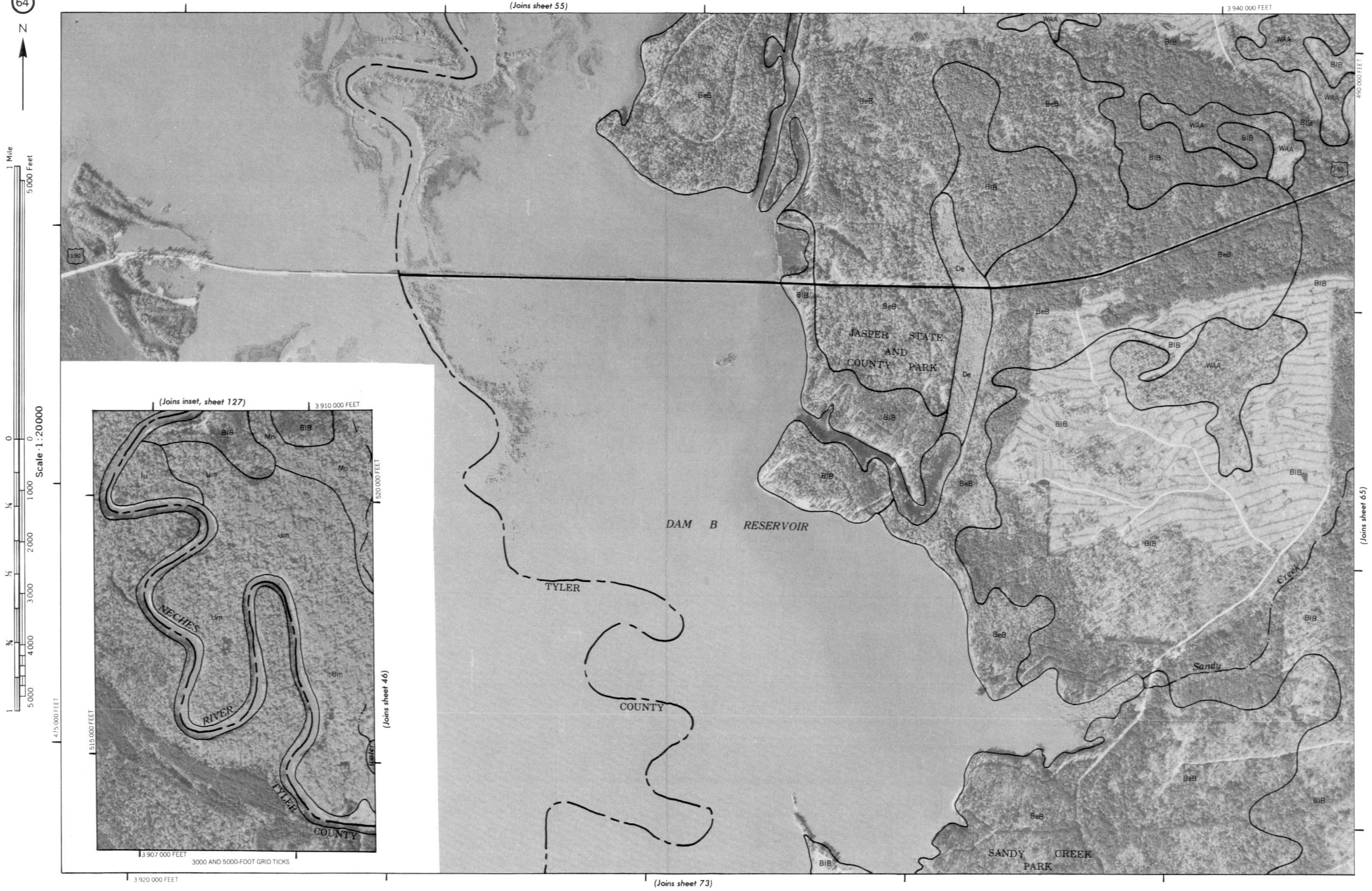


JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 62

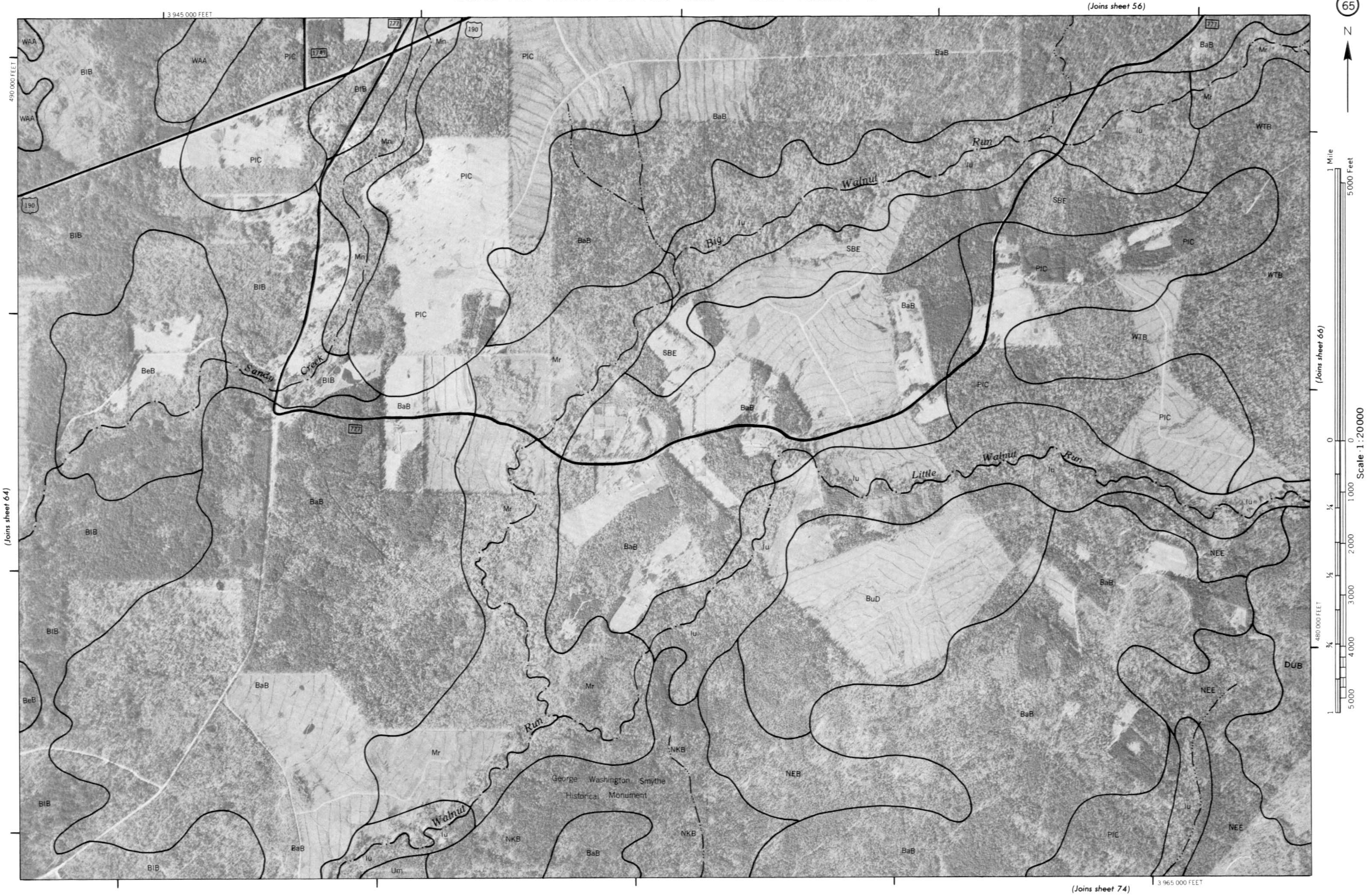


JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 63

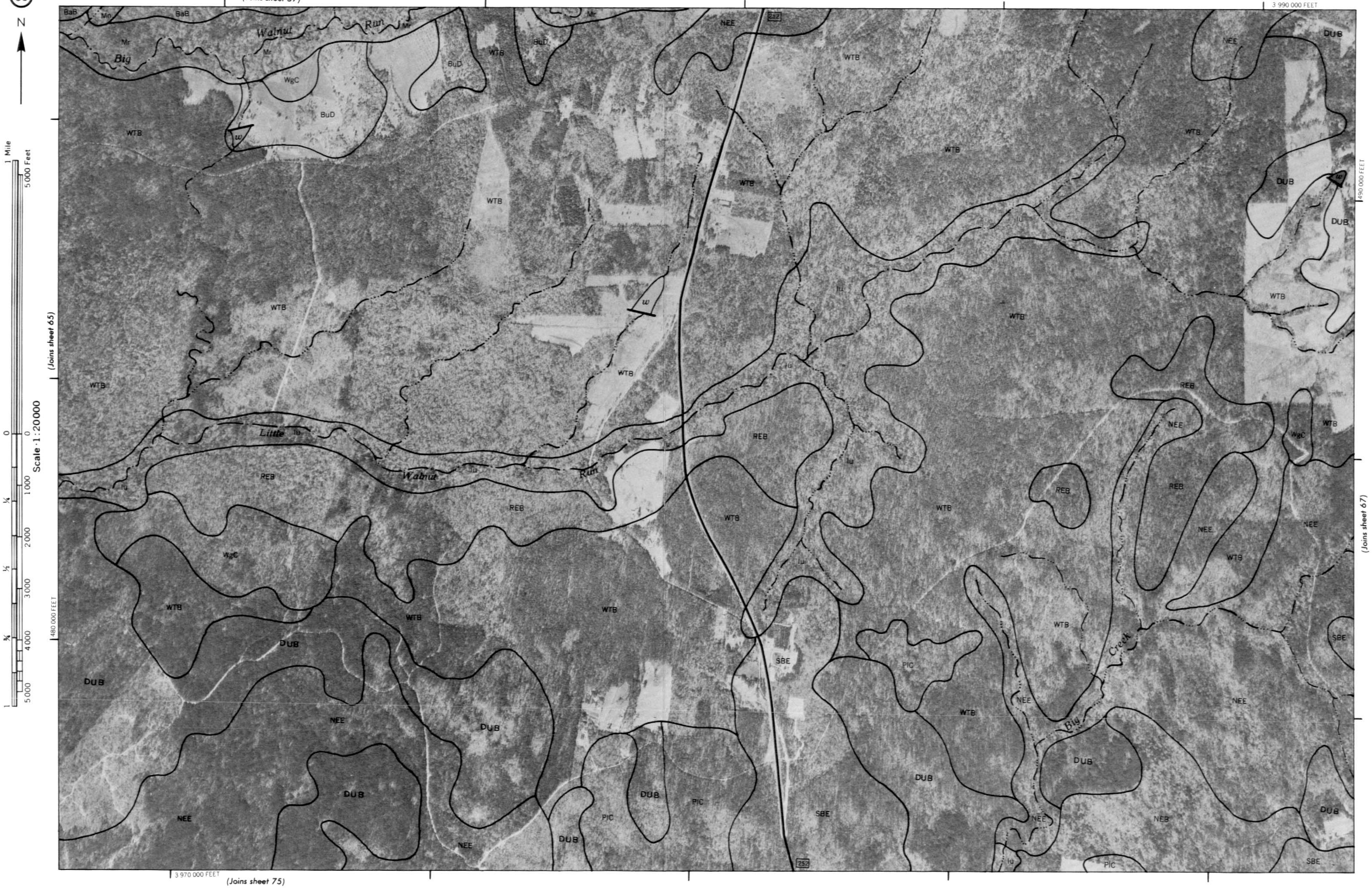



N
1 Mile
5000 Feet
Scale 1:20000
0
1000
2000
3000
4000
5000
0
¼
½
¾
1
(Joins sheet 55)
3 940 000 FEET
490 000 FEET
475 000 FEET
3 920 000 FEET
(Joins sheet 65)
(Joins sheet 73)
190
WAA
BlB
BeB
De
JASPER STATE AND COUNTY PARK
DAM B RESERVOIR
TYLER COUNTY
Sandy Creek
SANDY CREEK PARK
(Joins inset, sheet 127)
3 910 000 FEET
520 000 FEET
515 000 FEET
(Joins sheet 46)
3 907 000 FEET
3000 AND 5000-FOOT GRID TICKS
Iu
Um
Mn
NECHES RIVER
TYLER COUNTY
Water

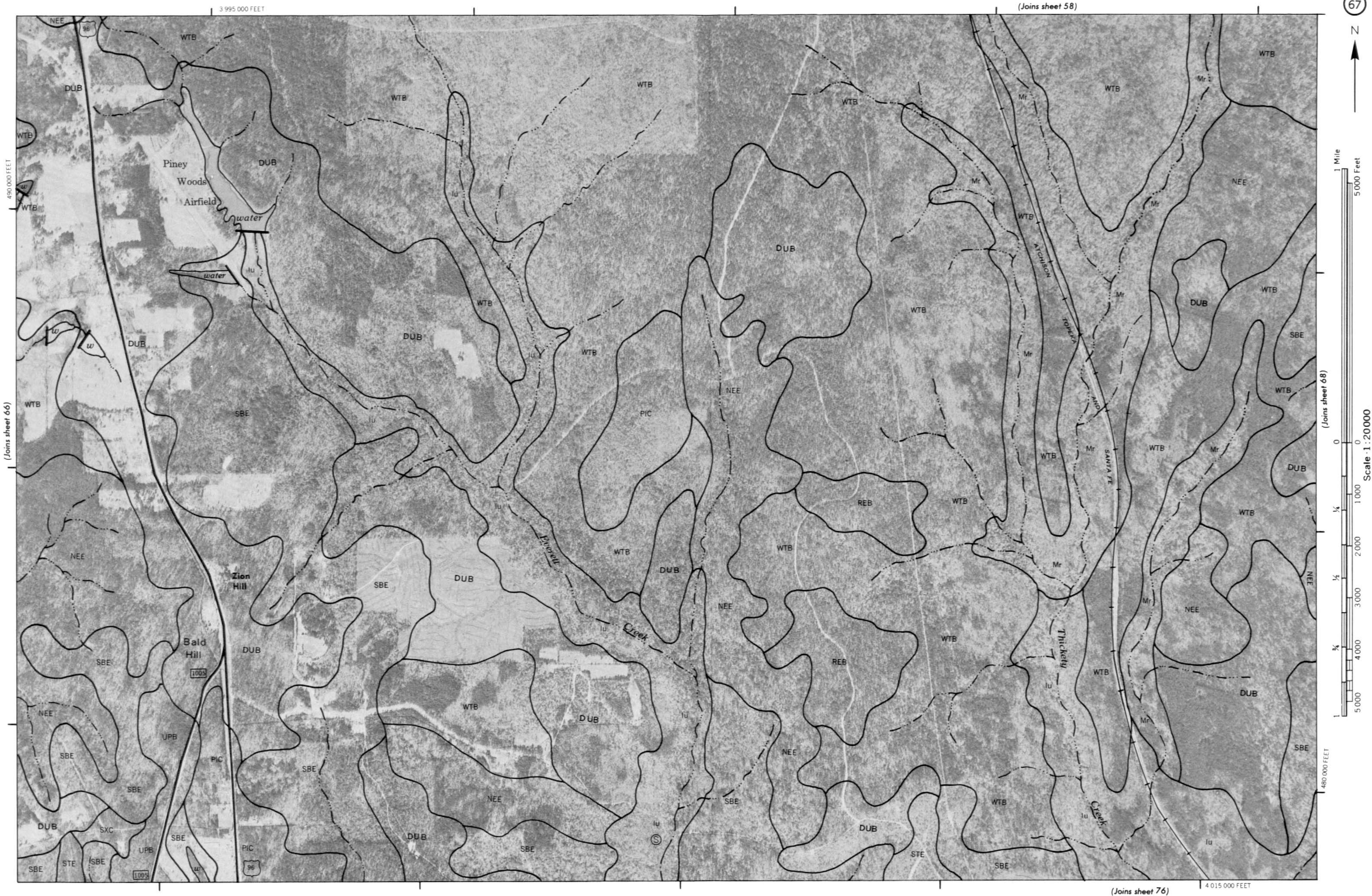
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 65

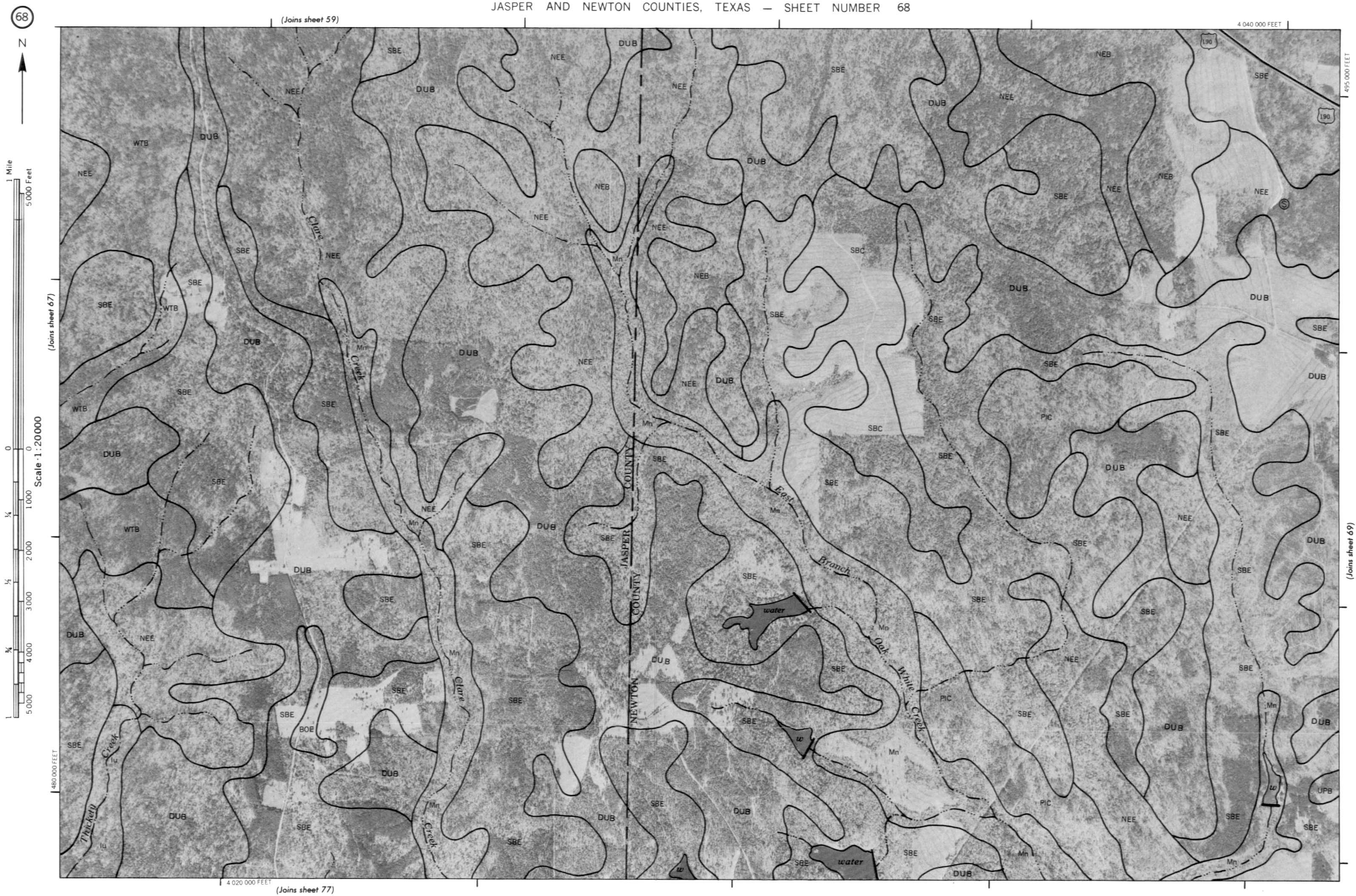


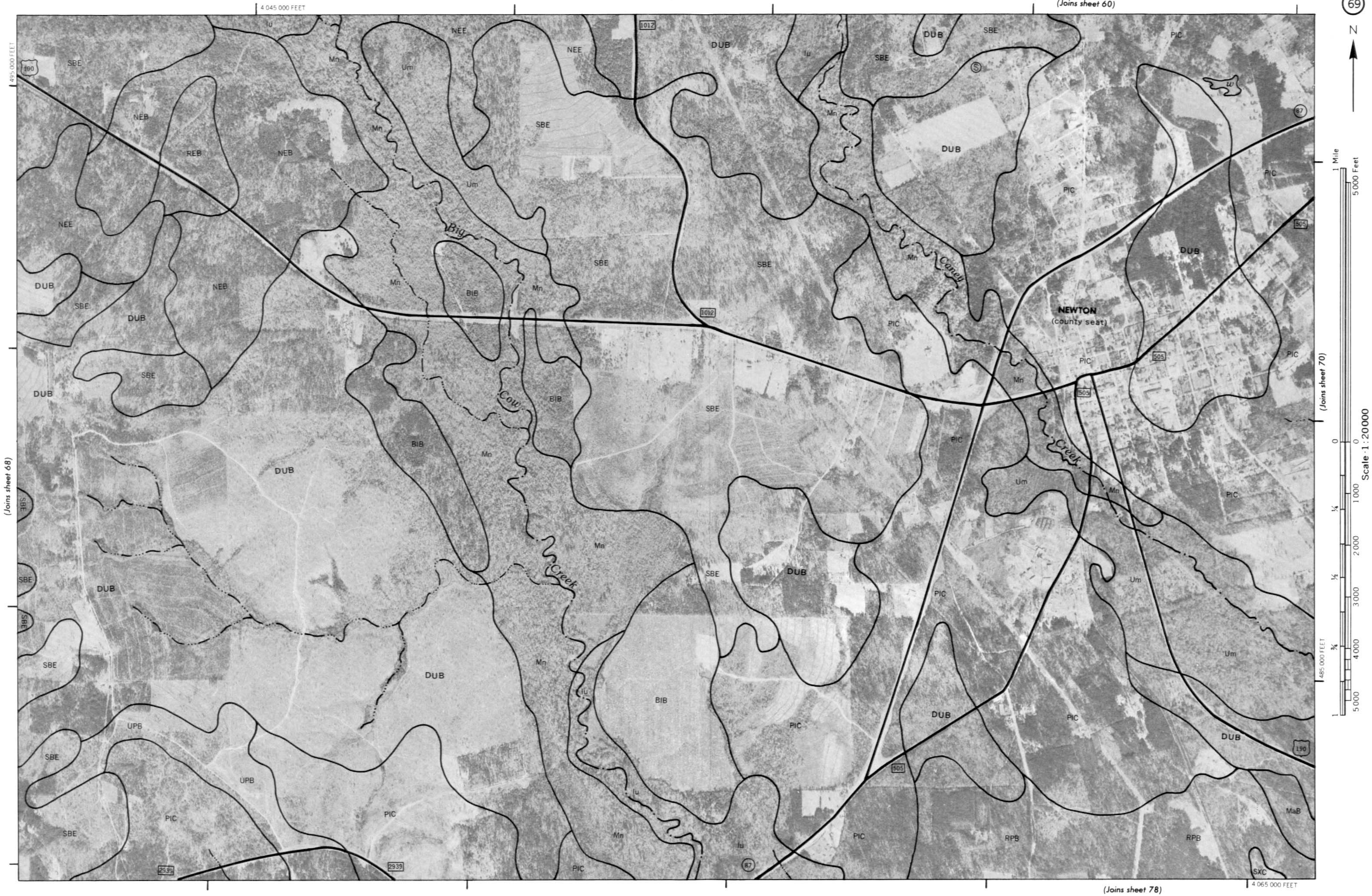
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 66



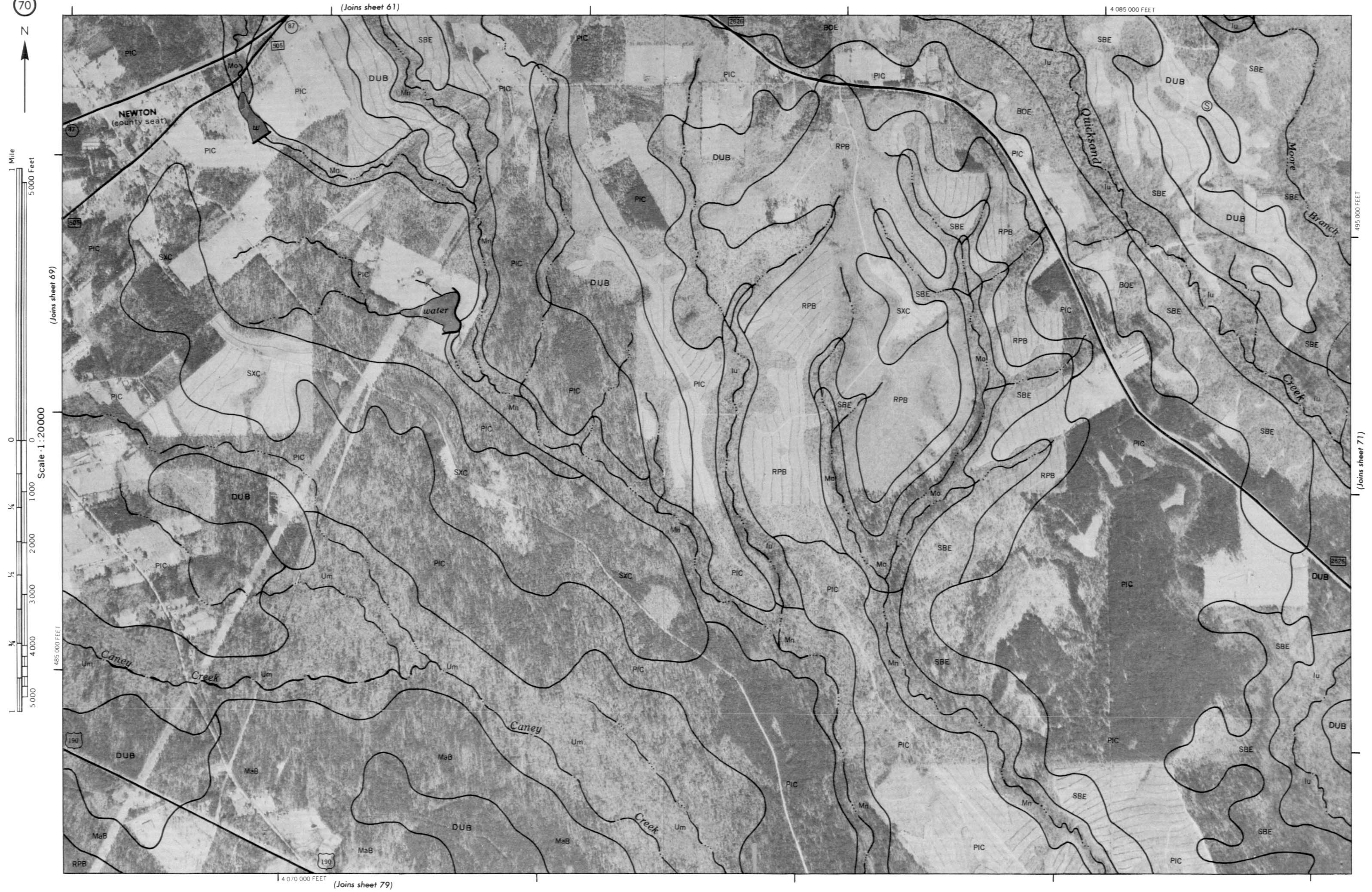
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 67

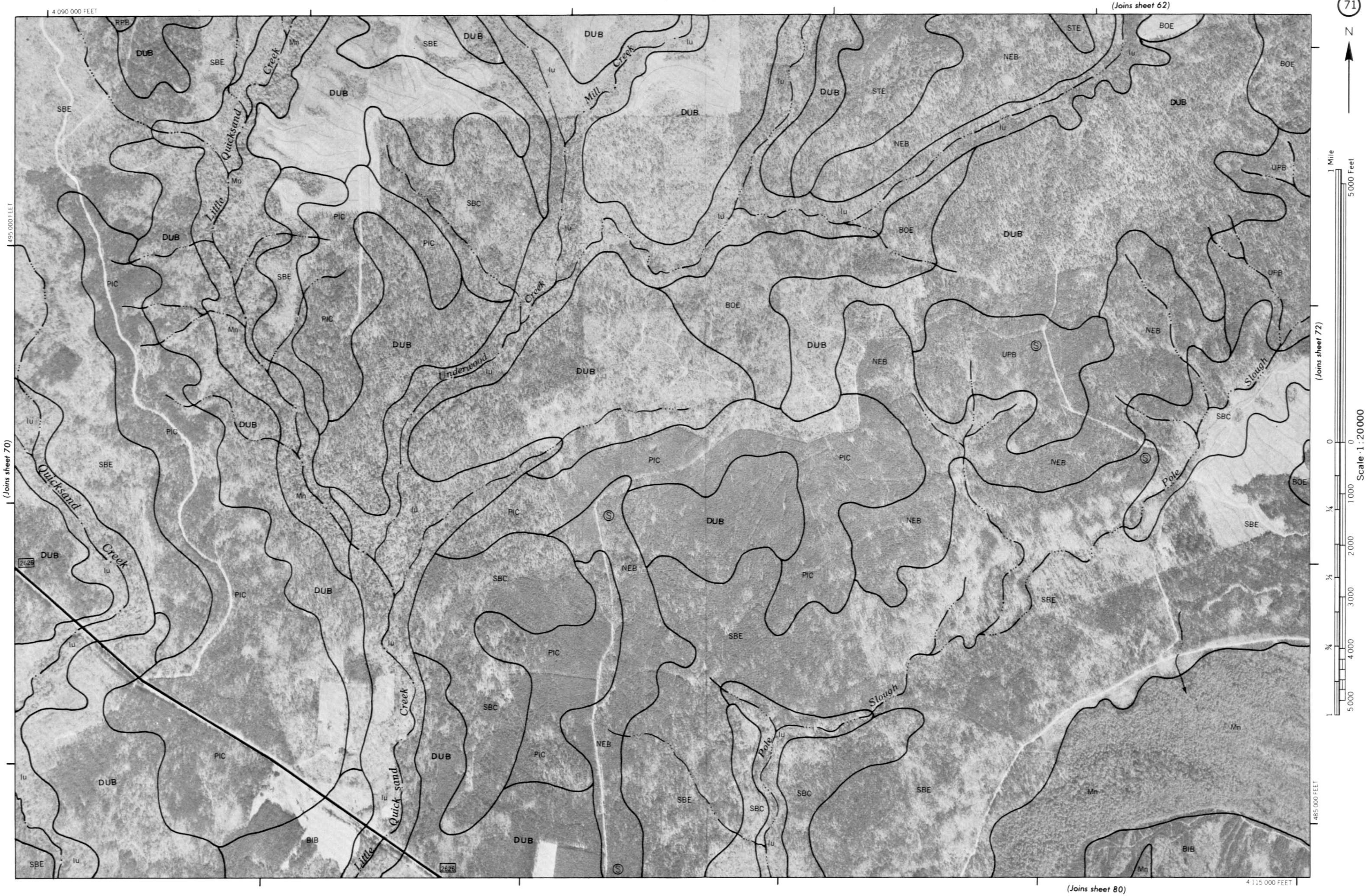



68
N
(Joins sheet 59)
4 040 000 FEET
495 000 FEET
(Joins sheet 67)
(Joins sheet 69)
480 000 FEET
4 020 000 FEET
(Joins sheet 77)
1 Mile
5 000 Feet
Scale 1:20000
0
¼
½
¾
1
0
1000
2000
3000
4000
5000
190
Clear Creek
East Branch
Oak White Creek
Thickety Creek
JASPER COUNTY
NEWTON COUNTY
water
w
S
SBE
DUB
NEE
NEB
WTB
SBC
PIC
Mn
BOE
UPB
lu

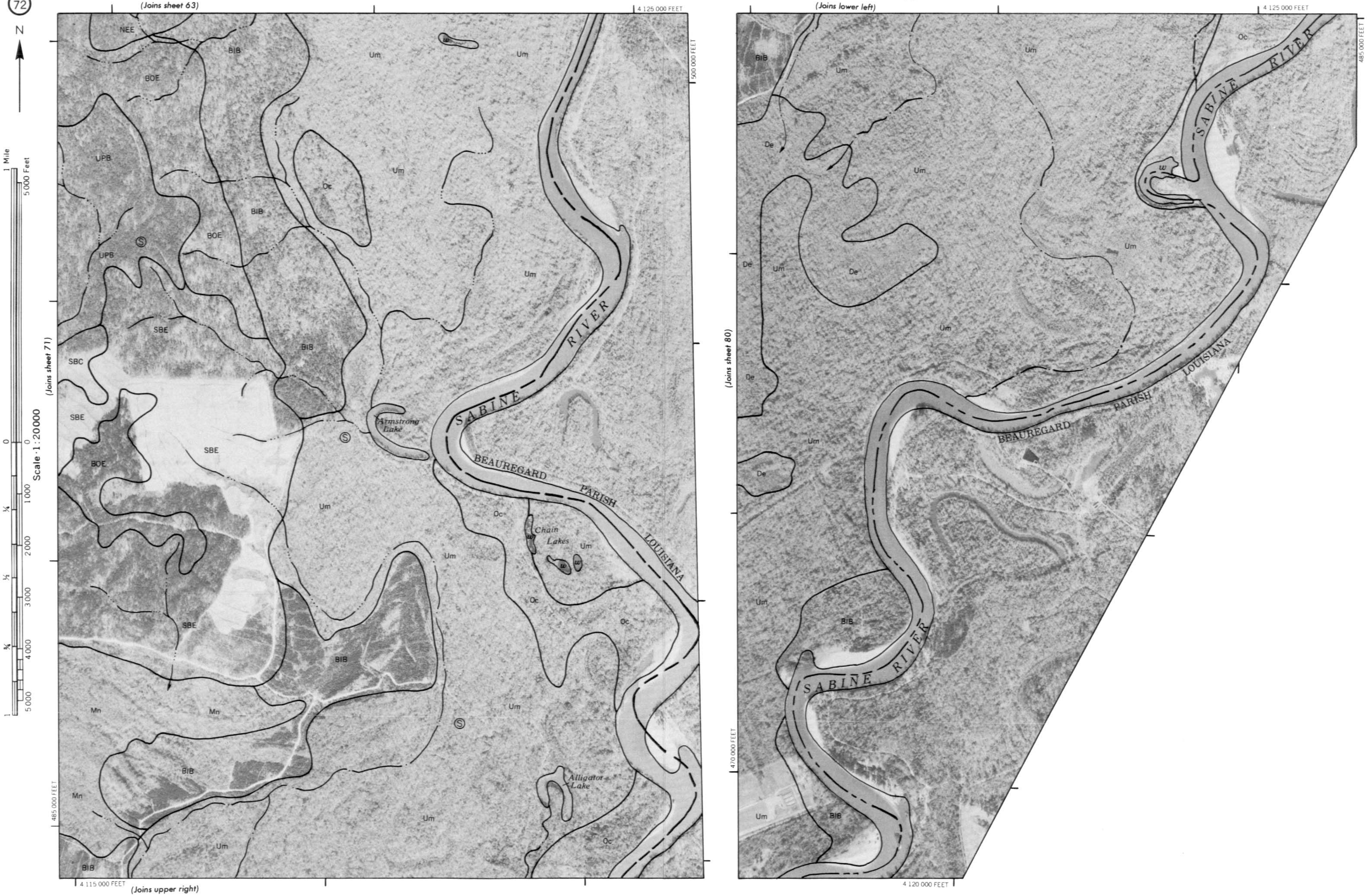

4 045 000 FEET
(Joins sheet 60)
495 000 FEET
N
1 Mile
5000 Feet
(Joins sheet 70)
(Joins sheet 68)
Scale 1:20000
0
¼
½
¾
1
1000
2000
3000
4000
5000
485 000 FEET
4 065 000 FEET
(Joins sheet 78)
NEWTON
(county seat)
Big
Cow
Creek
Caney
Creek
190
1012
505
87
2939
SBE
NEE
NEB
REB
DUB
Iu
Mn
Um
BIB
PIC
UPB
RPB
MaB
SXC
w

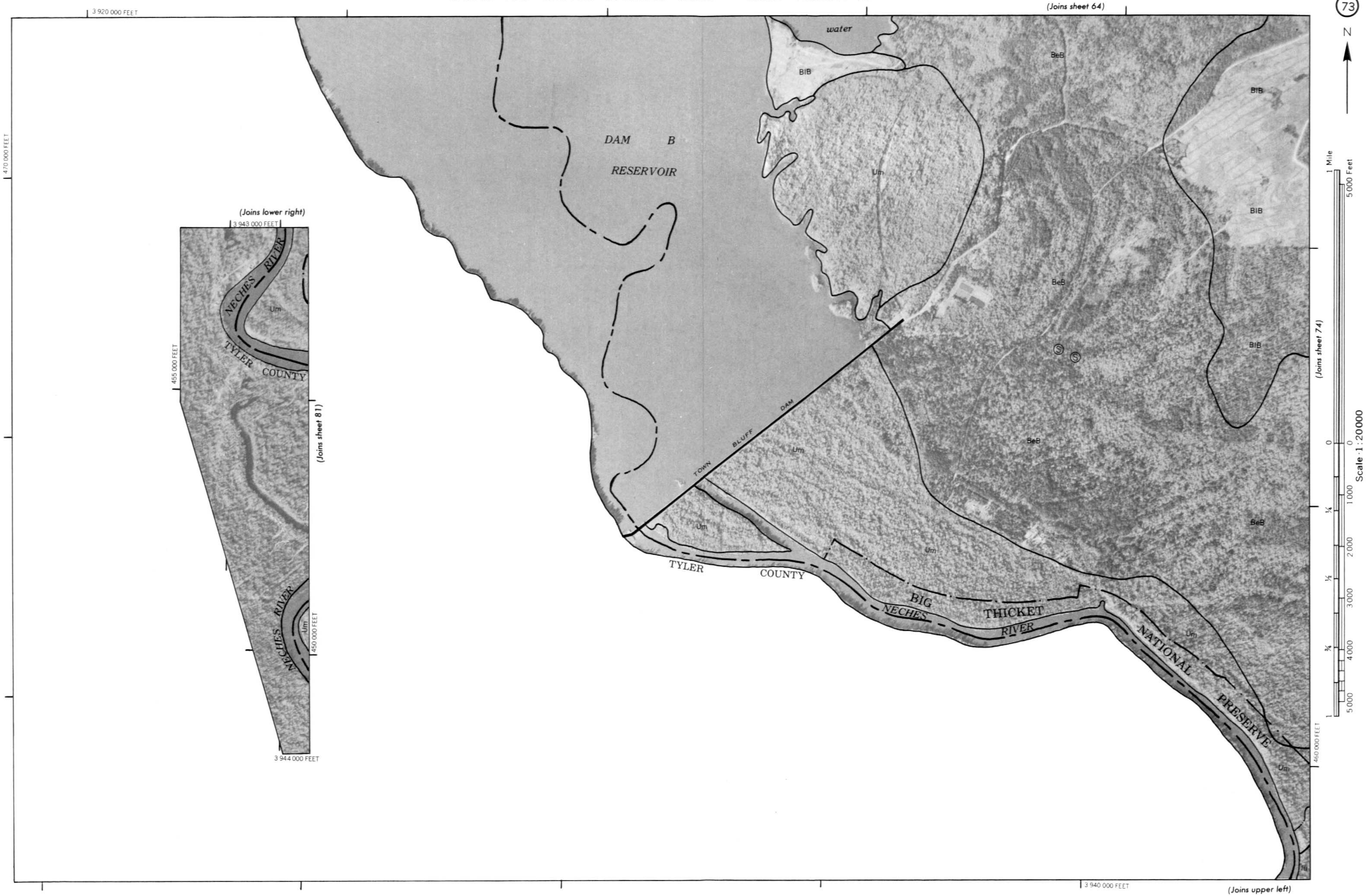
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 70

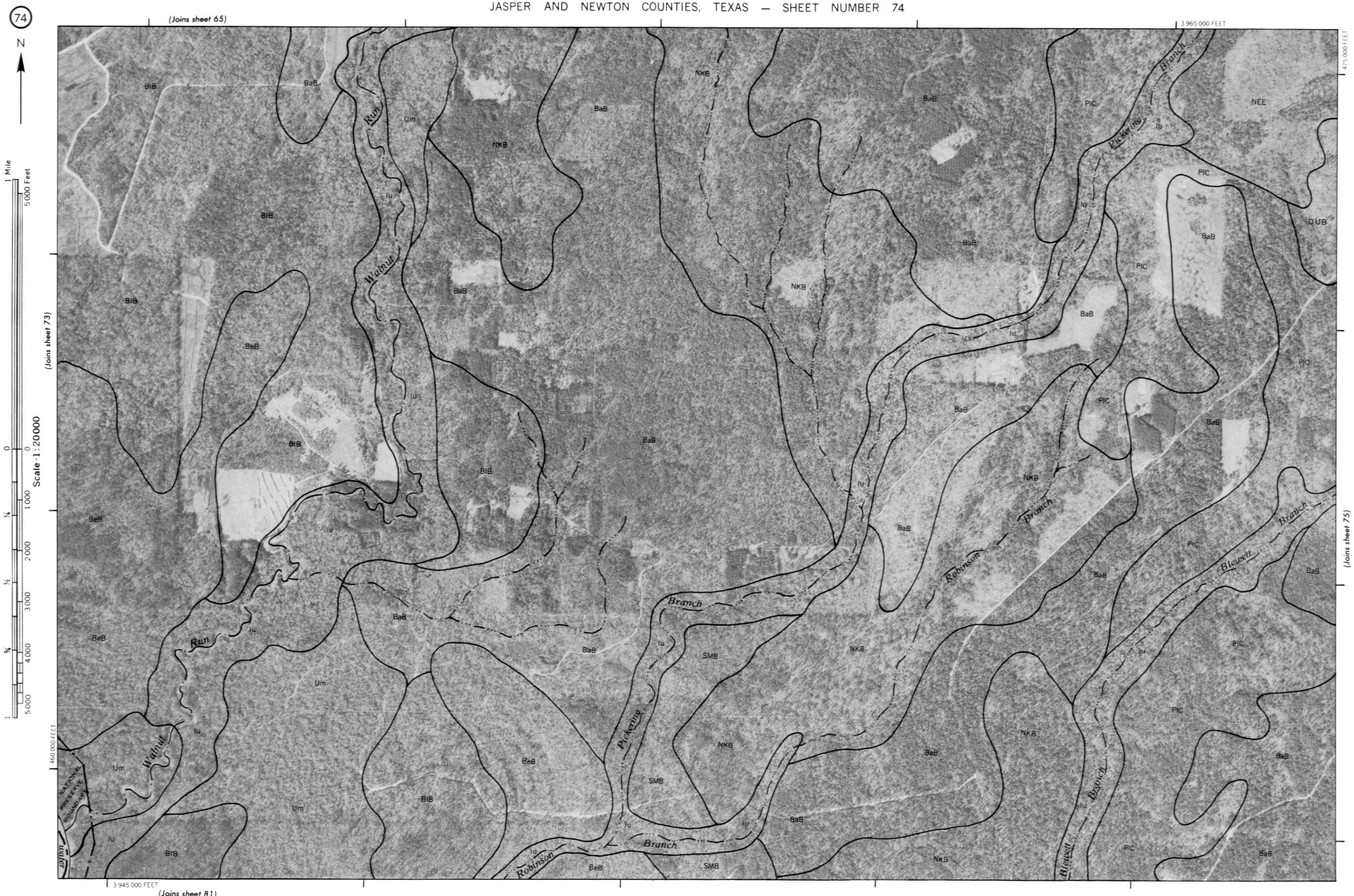


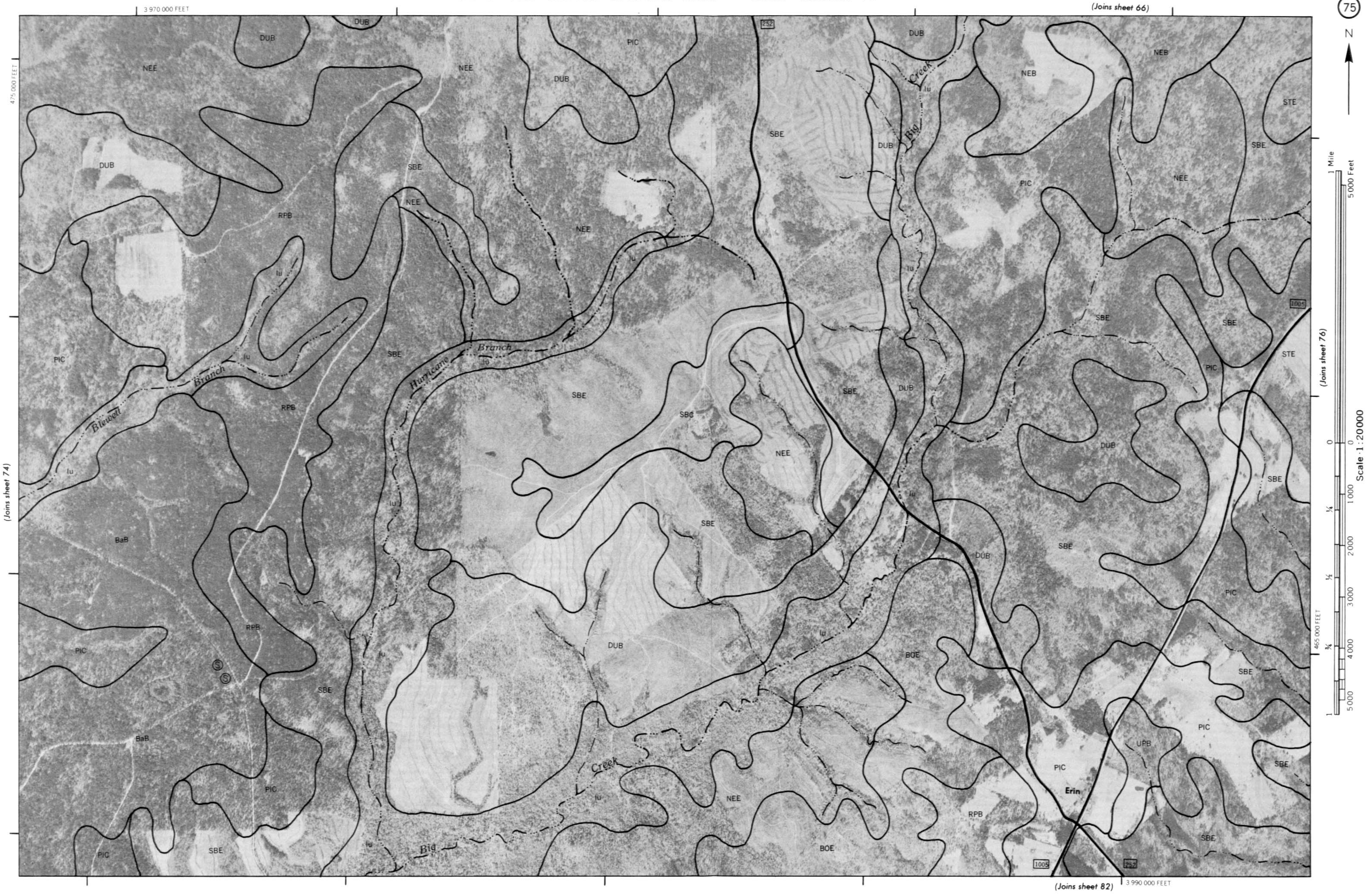

71
N
4 090 000 FEET
(Joins sheet 62)
(Joins sheet 70)
(Joins sheet 72)
(Joins sheet 80)
495 000 FEET
485 000 FEET
4 115 000 FEET
RPB
DUB
SBE
BOE
STE
NEB
UPB
SBC
PIC
BOE
lu
Mn
BIB
Quicksand Creek
Little Quicksand Creek
Mill Creek
Underwood Creek
Pole Slough
2626
Ⓢ
1 Mile
5000 Feet
0
¼
½
¾
1
1000
2000
3000
4000
5000
Scale 1:20000

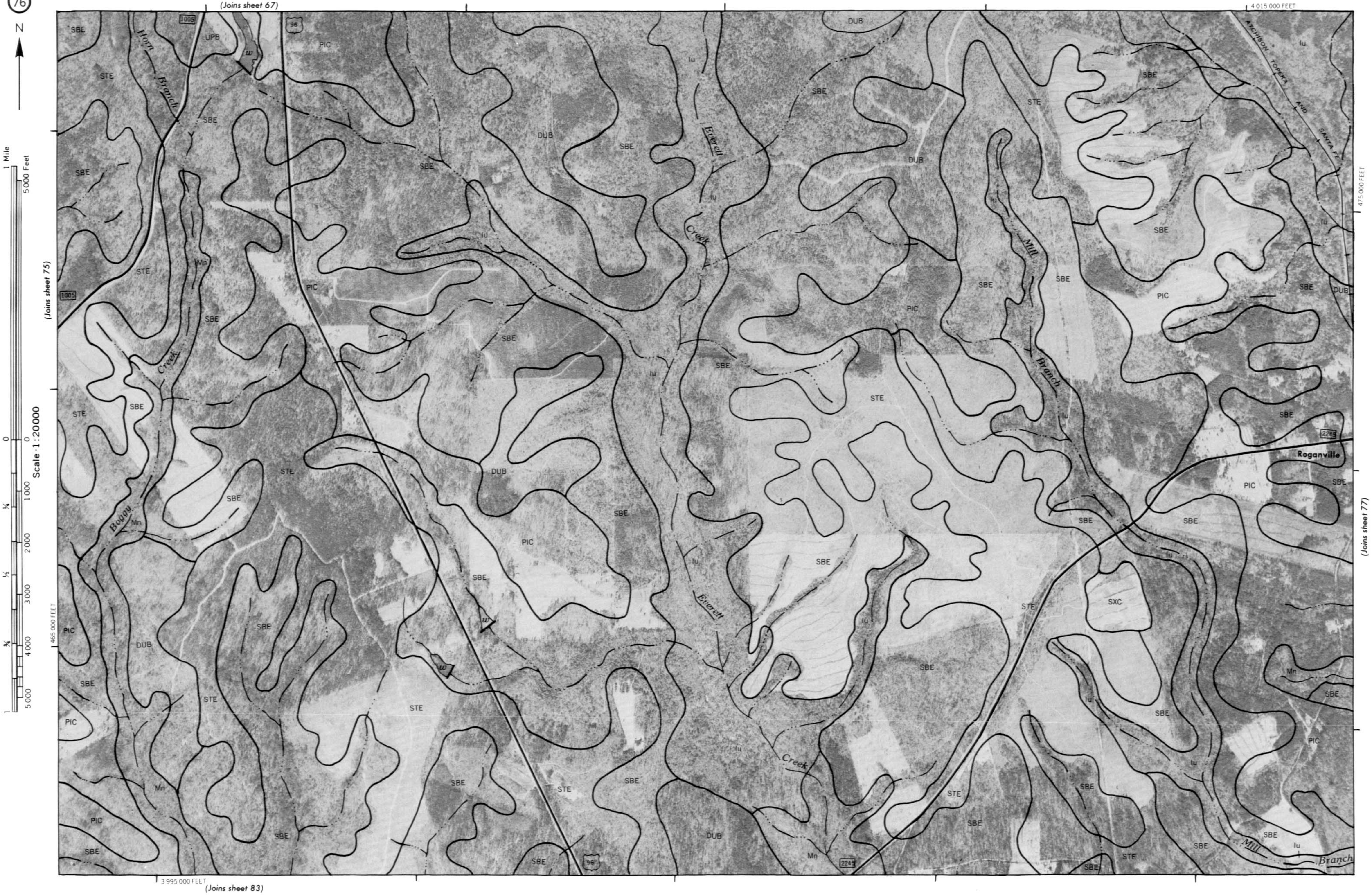
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 72



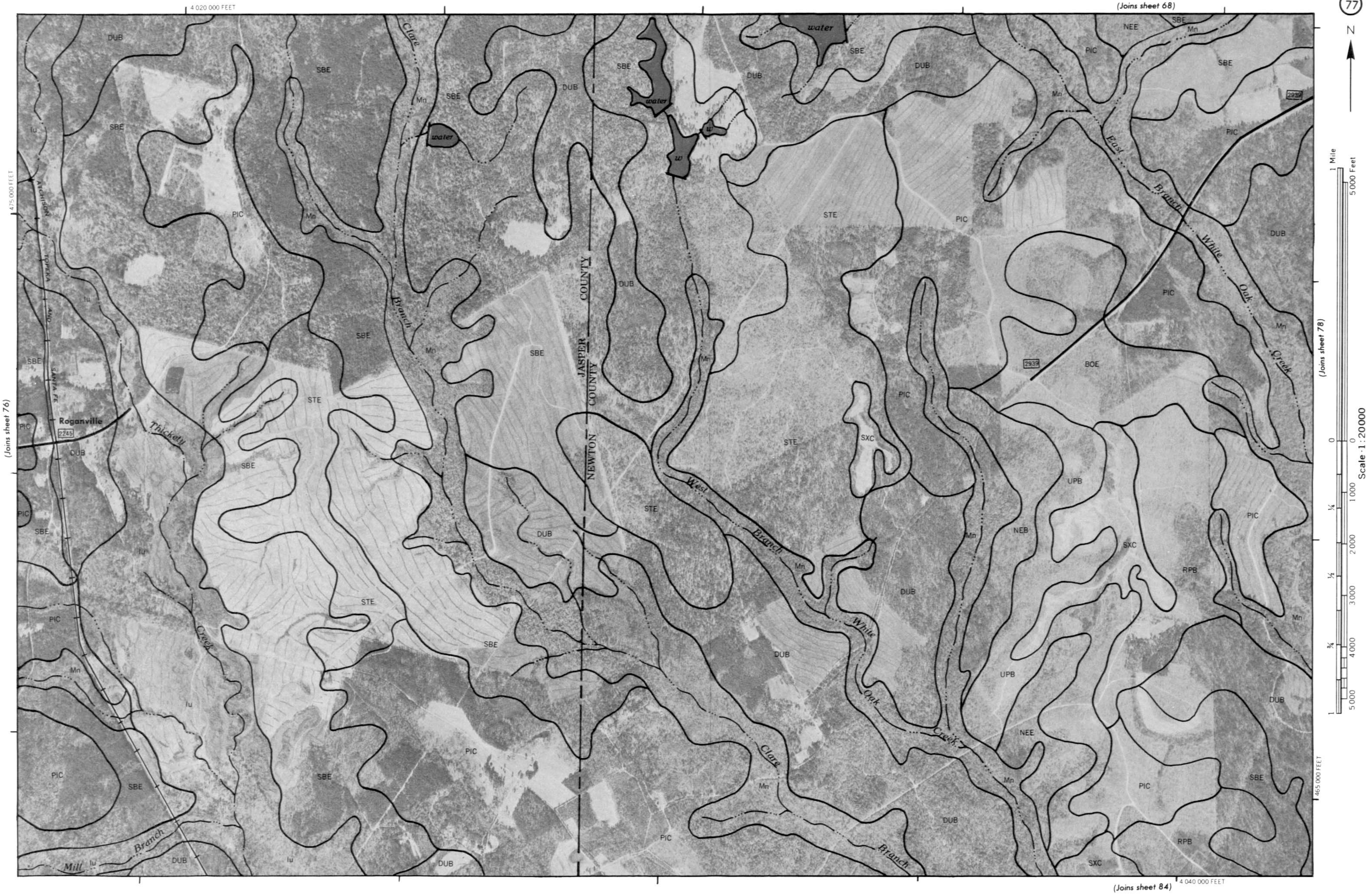

3 920 000 FEET
(Joins sheet 64)
N
water
BlB
BeB
DAM B
RESERVOIR
Um
470 000 FEET
(Joins lower right)
3 943 000 FEET
NECHES RIVER
Um
455 000 FEET
TYLER COUNTY
(Joins sheet 81)
(Joins sheet 74)
TOWN BLUFF DAM
TYLER COUNTY
BIG THICKET NATIONAL PRESERVE
NECHES RIVER
450 000 FEET
3 944 000 FEET
460 000 FEET
3 940 000 FEET
(Joins upper left)
1 Mile
5000 Feet
0
¼
½
¾
1
0
1000
2000
3000
4000
5000
Scale 1:20000

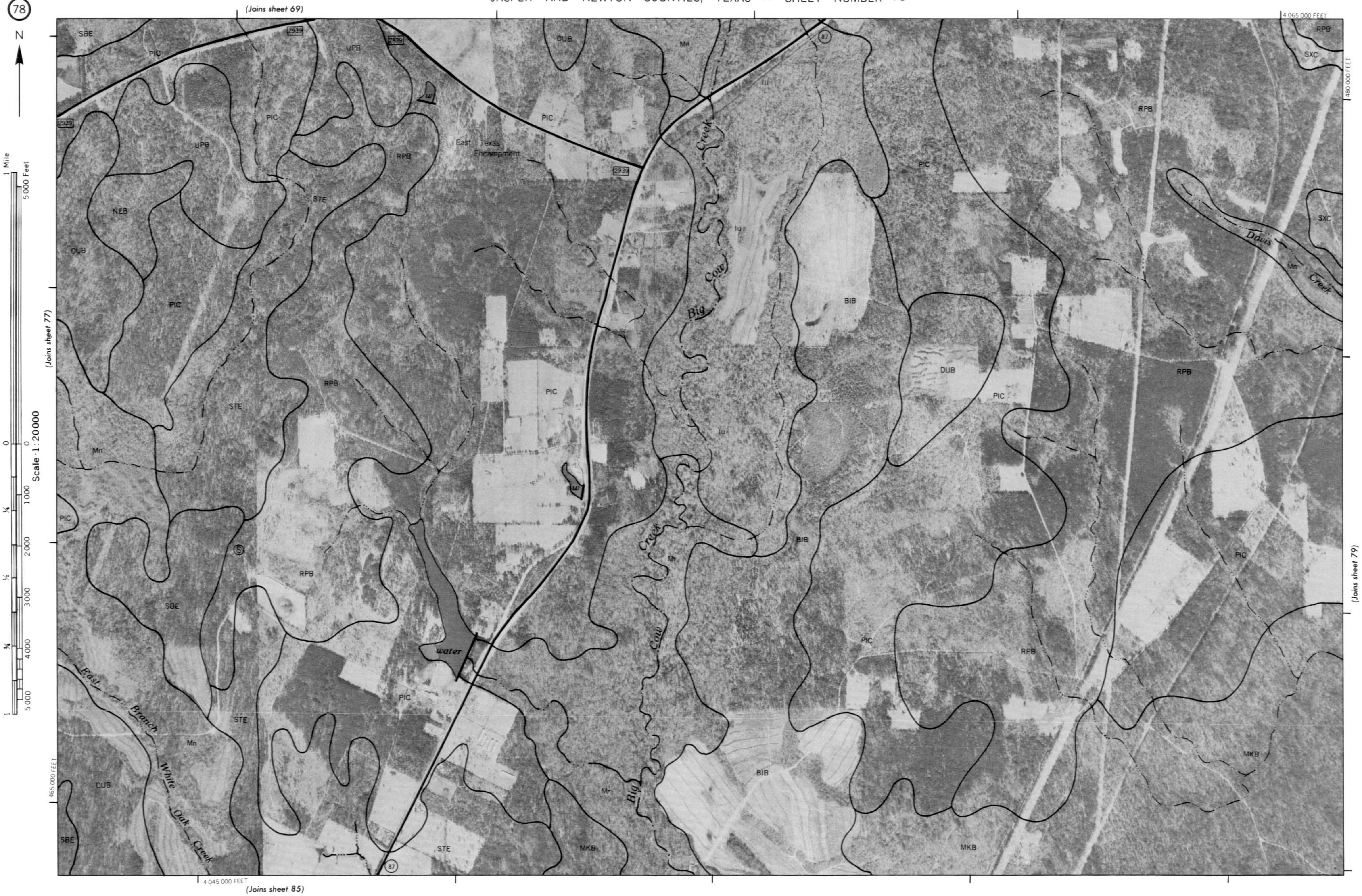

74
N
(Joins sheet 65)
3 965 000 FEET
475 000 FEET
(Joins sheet 73)
(Joins sheet 75)
(Joins sheet 81)
3 945 000 FEET
460 000 FEET
1 Mile
5000 Feet
Scale 1:20000
0
¼
½
¾
1
0
1000
2000
3000
4000
5000
BlB
BaB
lu
Um
Run
NKB
Walnut
BeB
BaB
NKB
PlC
NEE
Pickering
Branch
DUB
lu
Branch
Robinson
Blewett
SMB
NATIONAL PRESERVE BOUNDARY


75
N
3 970 000 FEET
475 000 FEET
(Joins sheet 66)
(Joins sheet 74)
(Joins sheet 76)
(Joins sheet 82)
3 990 000 FEET
465 000 FEET
1 Mile
5 000 Feet
0
¼
½
¾
1
0
1000
2000
3000
4000
5000
Scale 1:20000
252
1005
DUB
NEE
PIC
NEB
STE
SBE
RPB
Iu
Blewett
Branch
Hurricane
Branch
Big
Creek
BaB
SBC
BOE
UPB
Erin

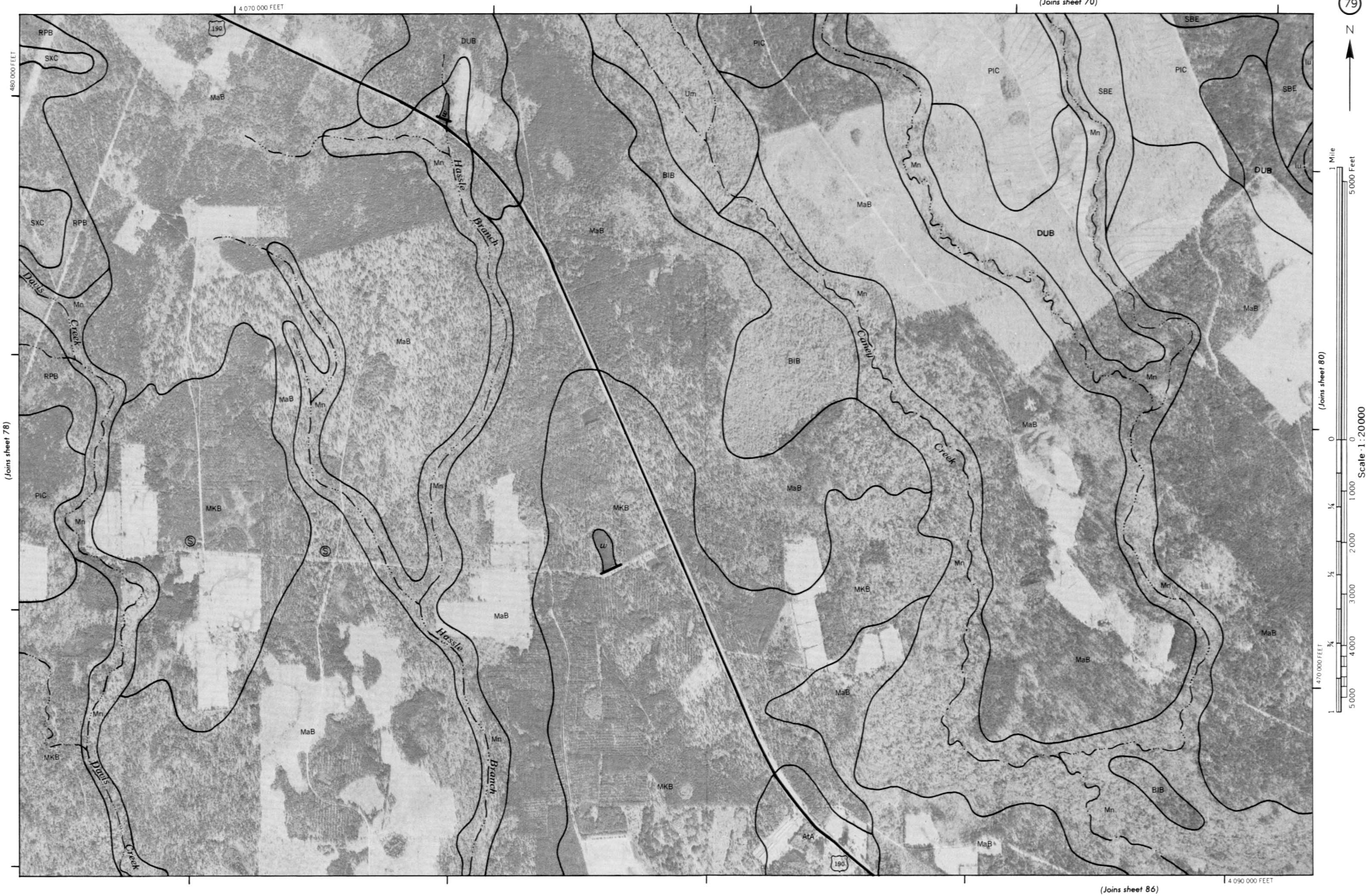

(Joins sheet 67)
(Joins sheet 75)
(Joins sheet 77)
(Joins sheet 83)
N
1 Mile
5 000 Feet
Scale 1:20000
0
¼
½
¾
1
1000
2000
3000
4000
5000
4 015 000 FEET
475 000 FEET
465 000 FEET
3 995 000 FEET
ATCHISON TOPEKA AND SANTA FE
Roganville
Horn Branch
Boggy Creek
Everett Creek
Mill Branch
1005
96
2245
SBE
STE
DUB
PIC
UPB
Iu
Mn
SXC
W

JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 77



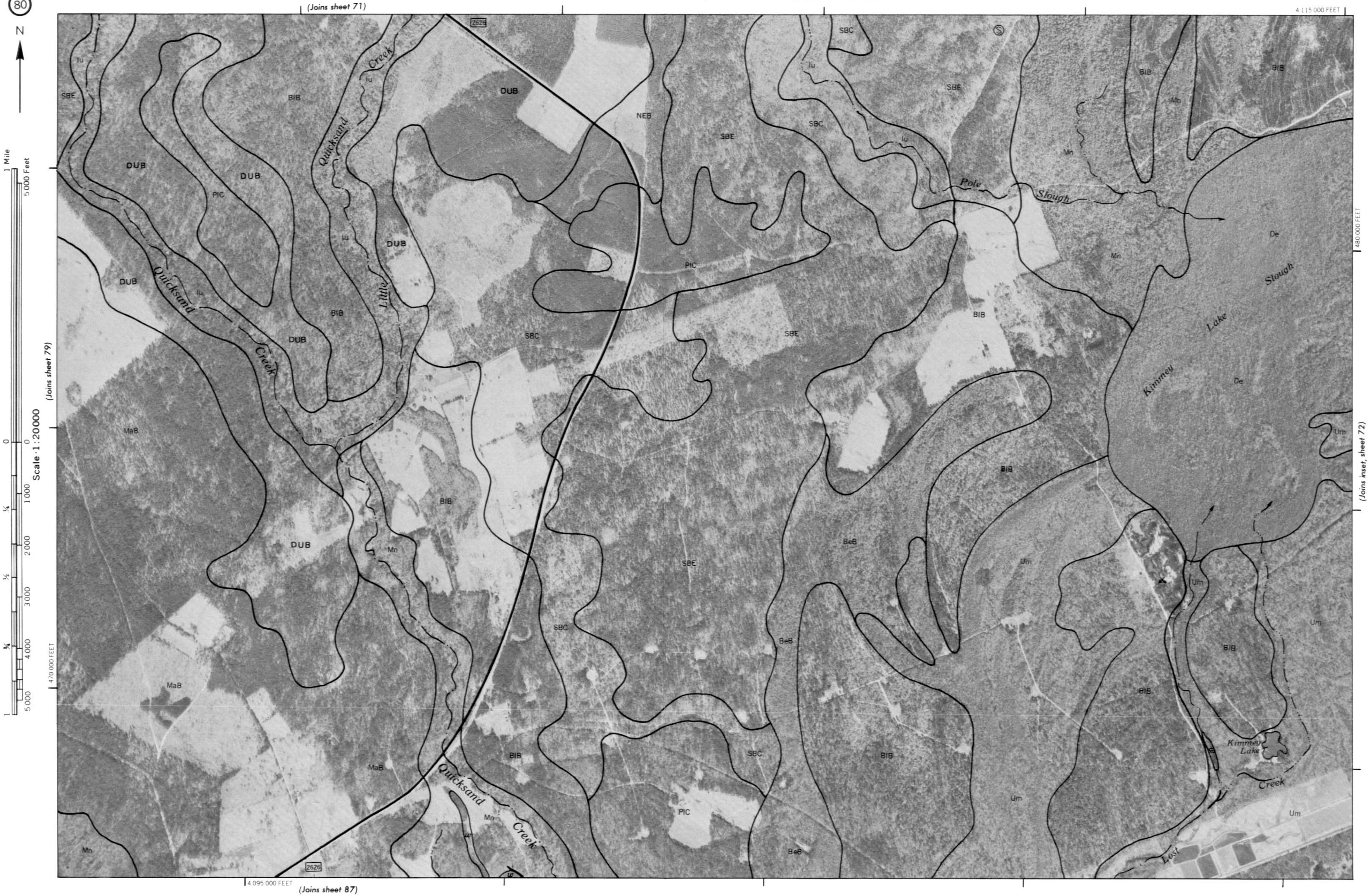

78
N
(Joins sheet 69)
(Joins sheet 77)
(Joins sheet 79)
(Joins sheet 85)
4 065 000 FEET
480 000 FEET
465 000 FEET
4 045 000 FEET
Scale 1:20000
1 Mile
5000 Feet
0
1/4
1/2
3/4
1
0
1000
2000
3000
4000
5000
2939
87
East Texas Encampment
Big Cow Creek
Davis Creek
East Branch White Oak Creek
water
w
SBE
PIC
UPB
DUB
Mn
Iu
RPB
SXC
NEB
STE
BIB
MKB

JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 79

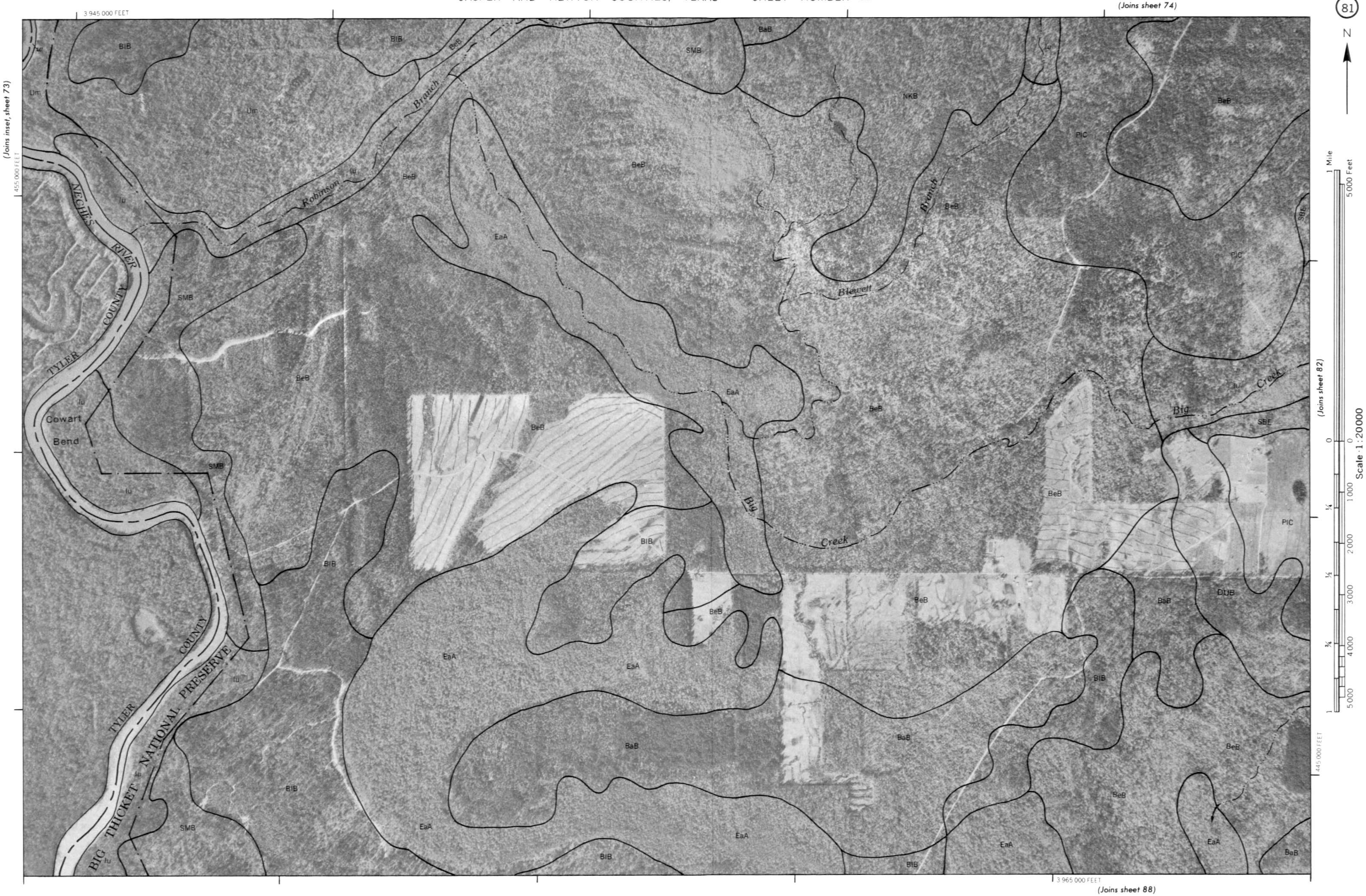


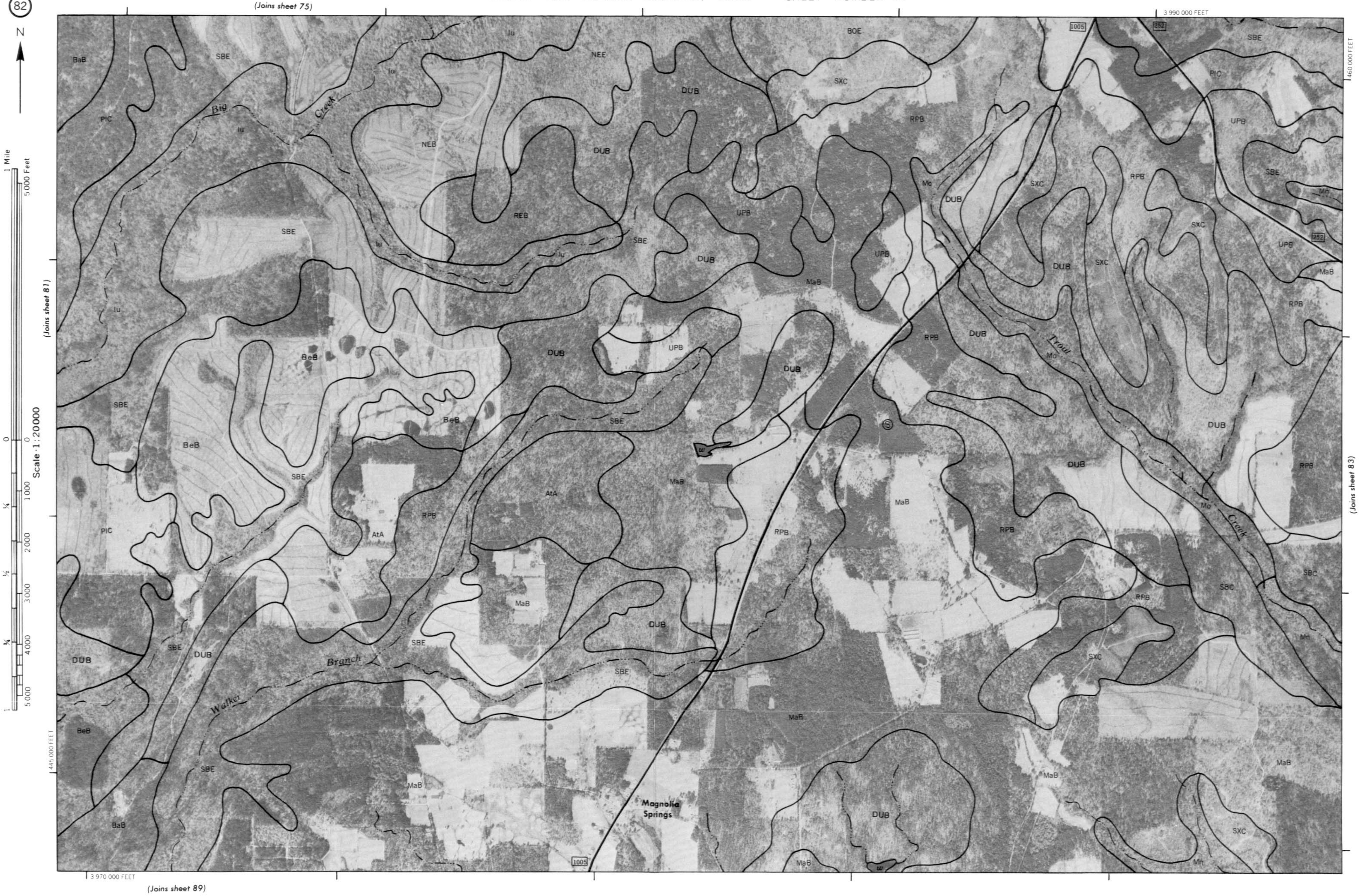
(80)

JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 80

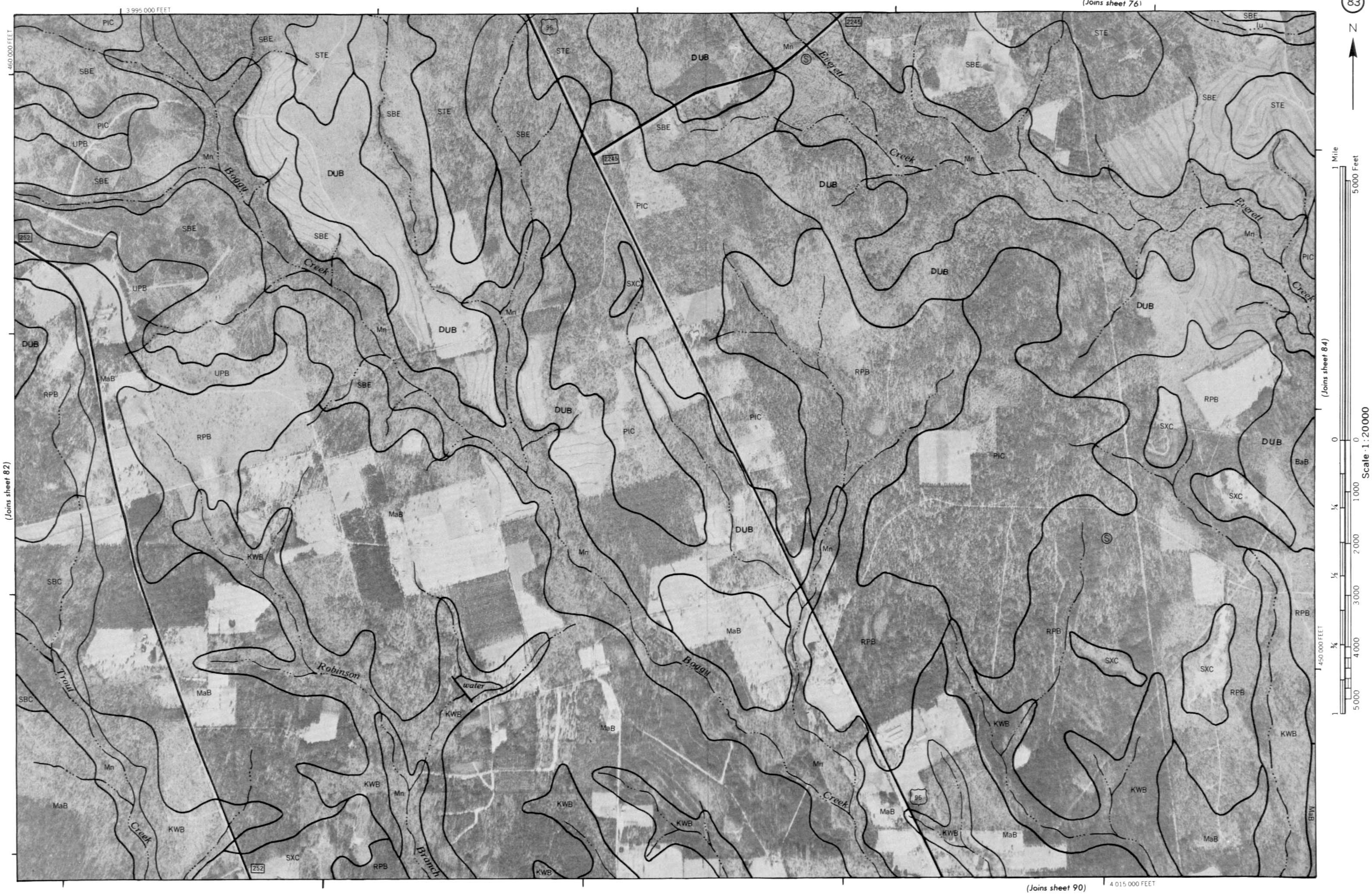


JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 81

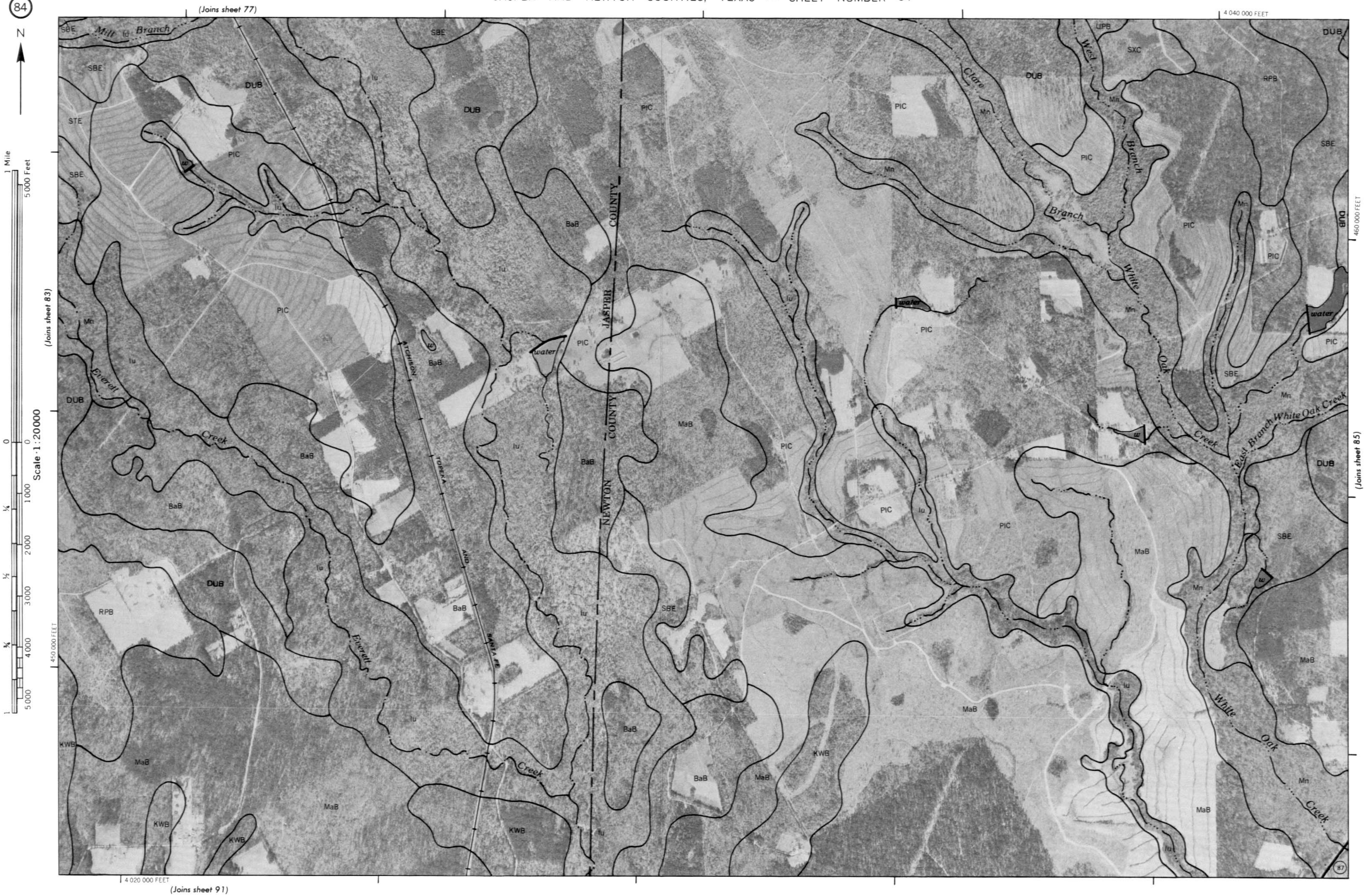



N
(Joins sheet 75)
(Joins sheet 81)
(Joins sheet 83)
(Joins sheet 89)
1 Mile
5 000 Feet
Scale 1:20000
0
¼
½
¾
1
1000
2000
3000
4000
5000
3 990 000 FEET
460 000 FEET
445 000 FEET
3 970 000 FEET
1005
252
BaB
SBE
Iu
NEE
BOE
SBE
PIC
Big
Creek
Iu
NEB
DUB
SXC
RPB
PIC
UPB
SBE
DUB
REB
Mo
DUB
SXC
RPB
SBE
Mn
SBE
Iu
SBE
UPB
DUB
UPB
SXC
UPB
MaB
DUB
SXC
MaB
RPB
BeB
DUB
UPB
DUB
RPB
DUB
Trout
Mo
SBE
BeB
SBE
BeB
SBE
MaB
w
AtA
DUB
RPB
PIC
AtA
RPB
MaB
RPB
DUB
RPB
Mo
Creek
SBC
SBC
RPB
MaB
DUB
SBE
DUB
SBE
Branch
SBE
SXC
Mn
Walker
MaB
BeB
SBE
MaB
MaB
MaB
BaB
Magnolia
Springs
DUB
SXC
MaB
w
Mn

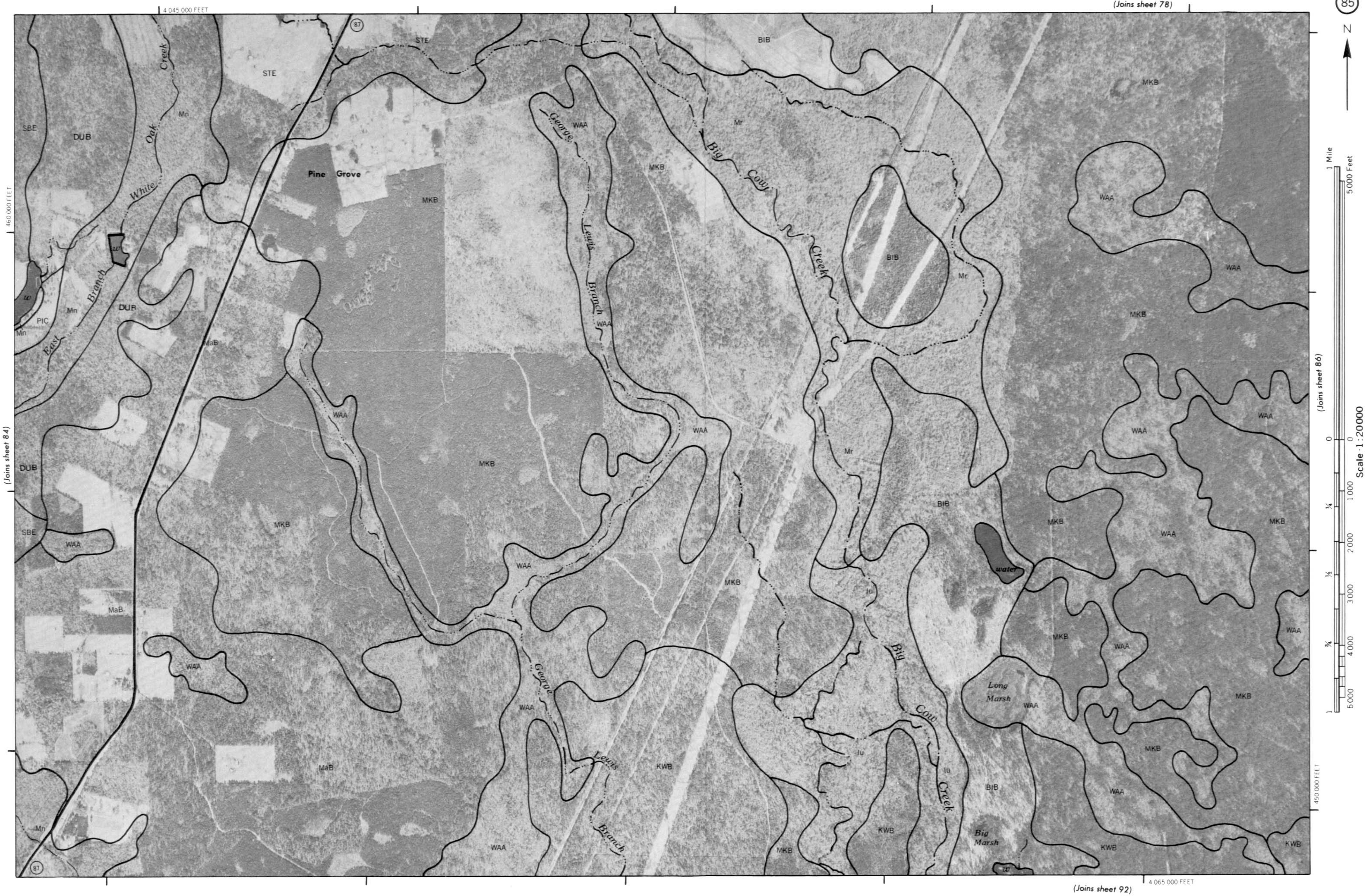
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 83



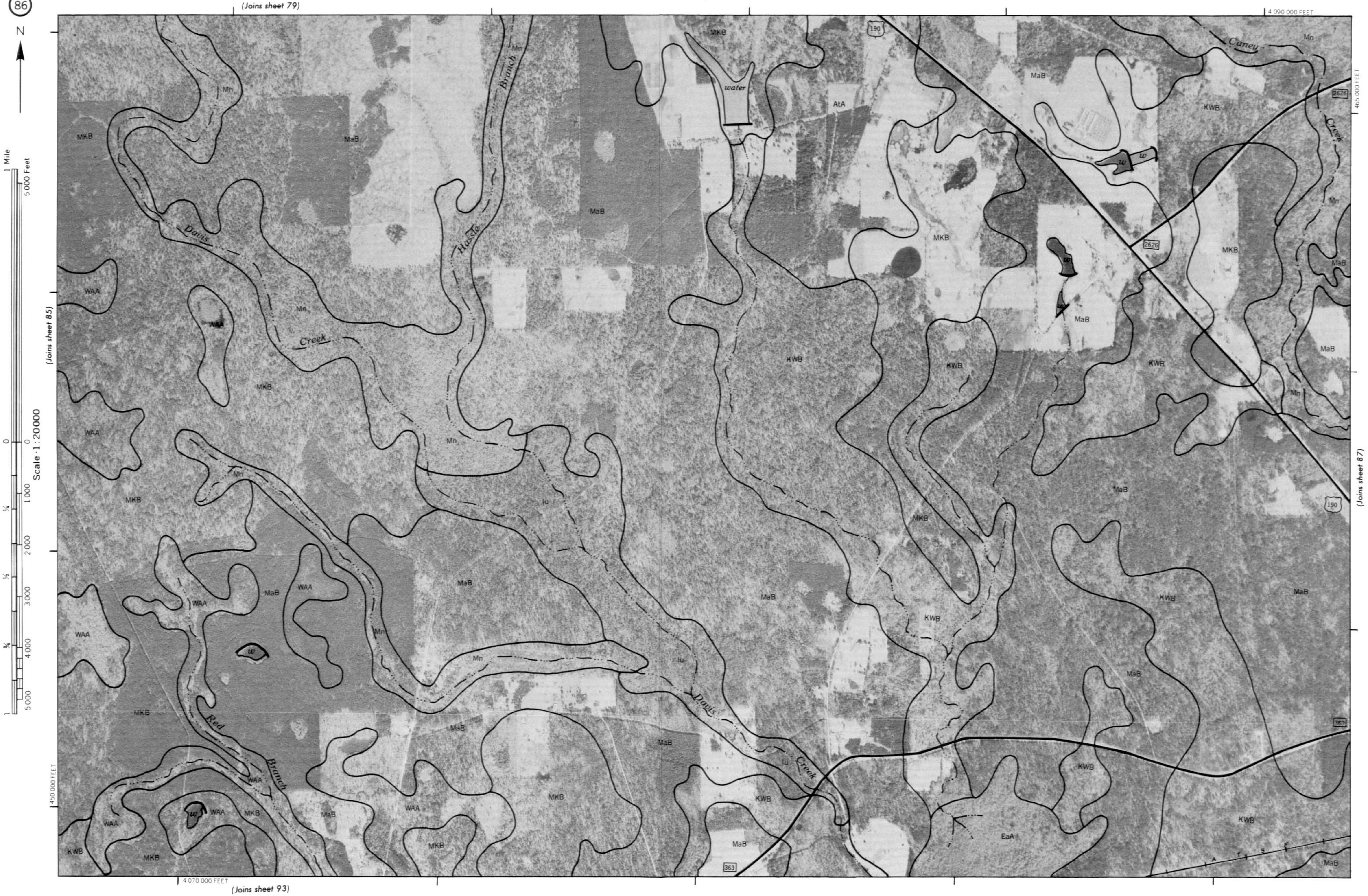
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 84

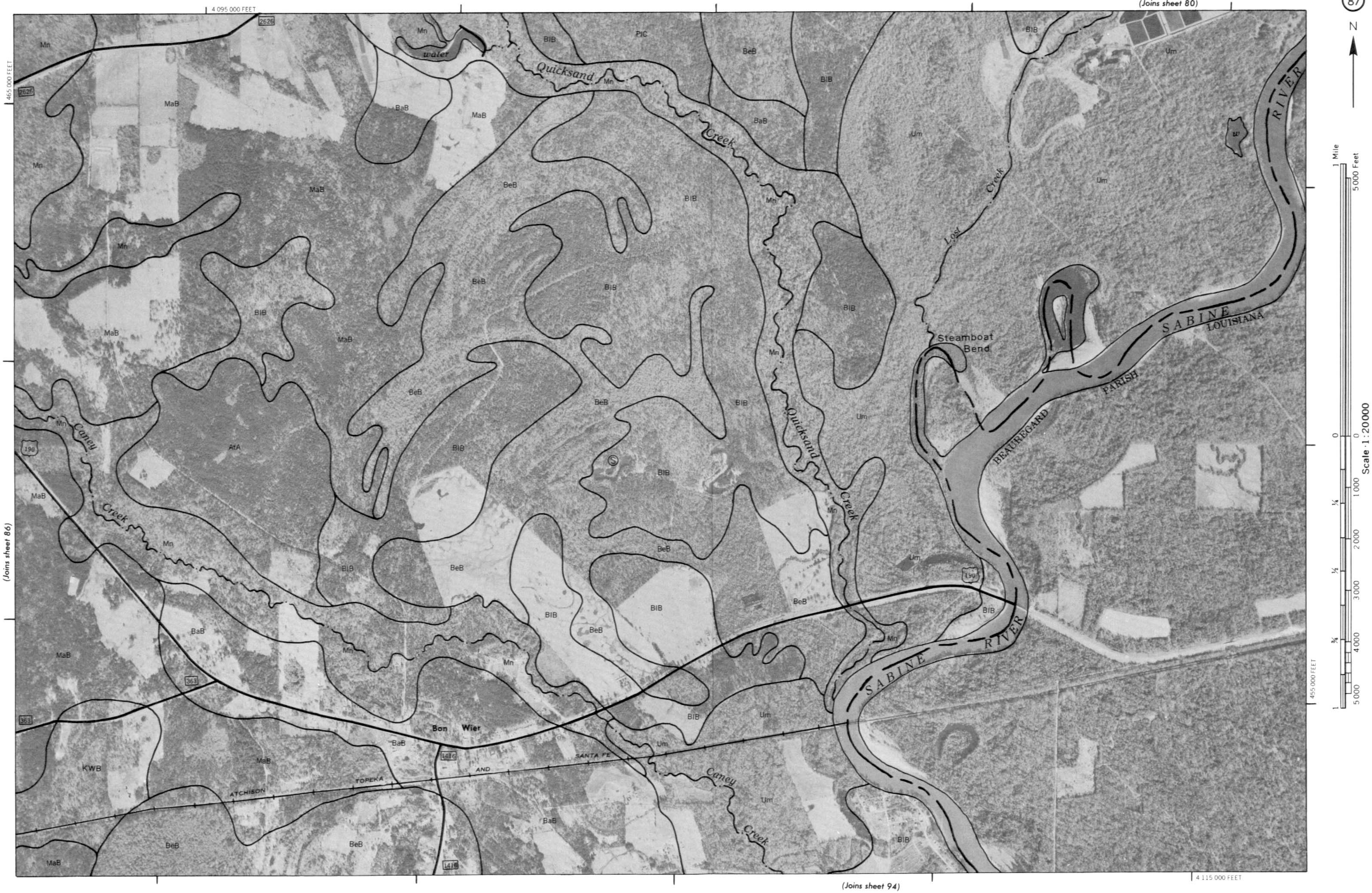


JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 85

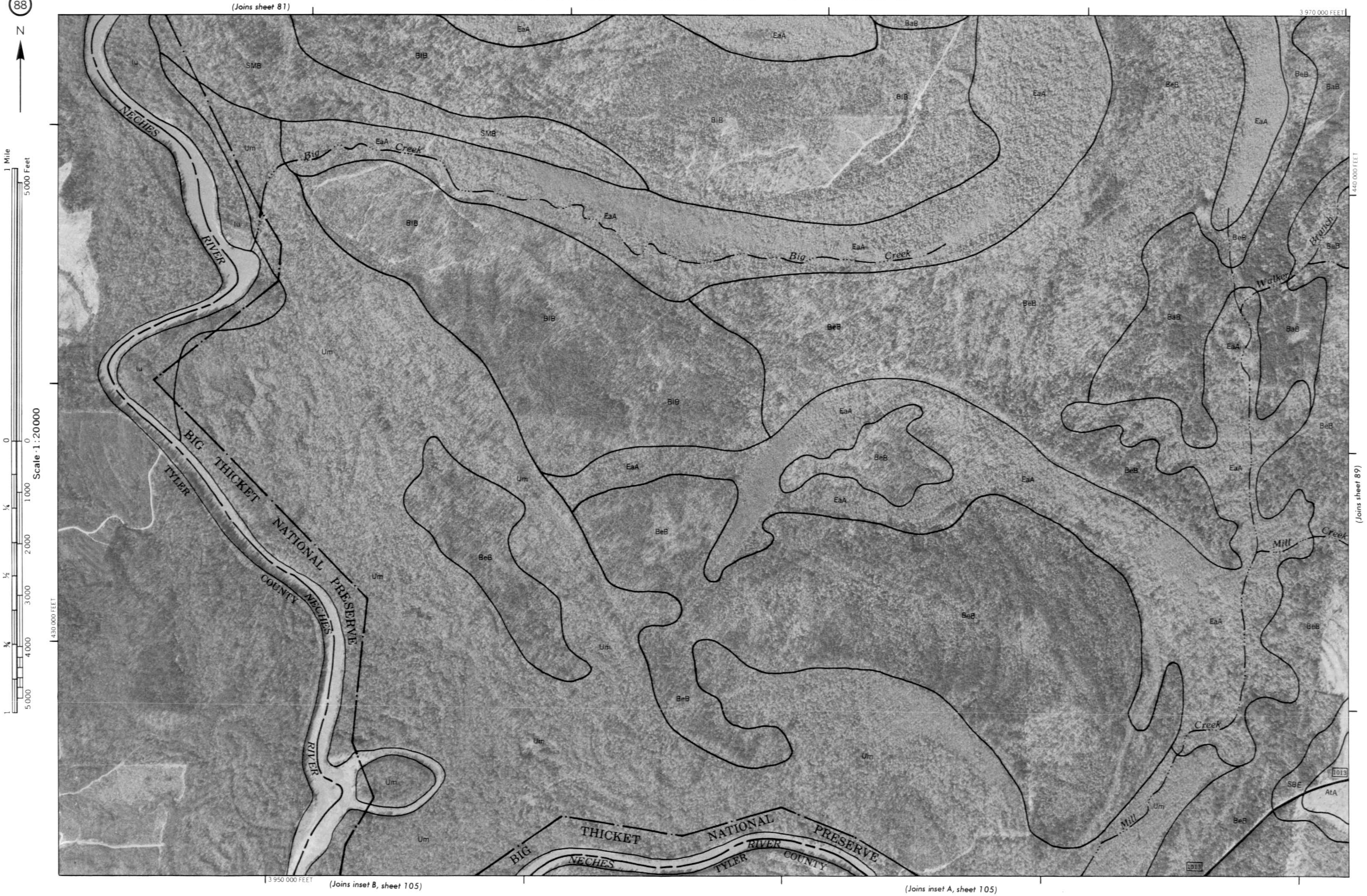


JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 86

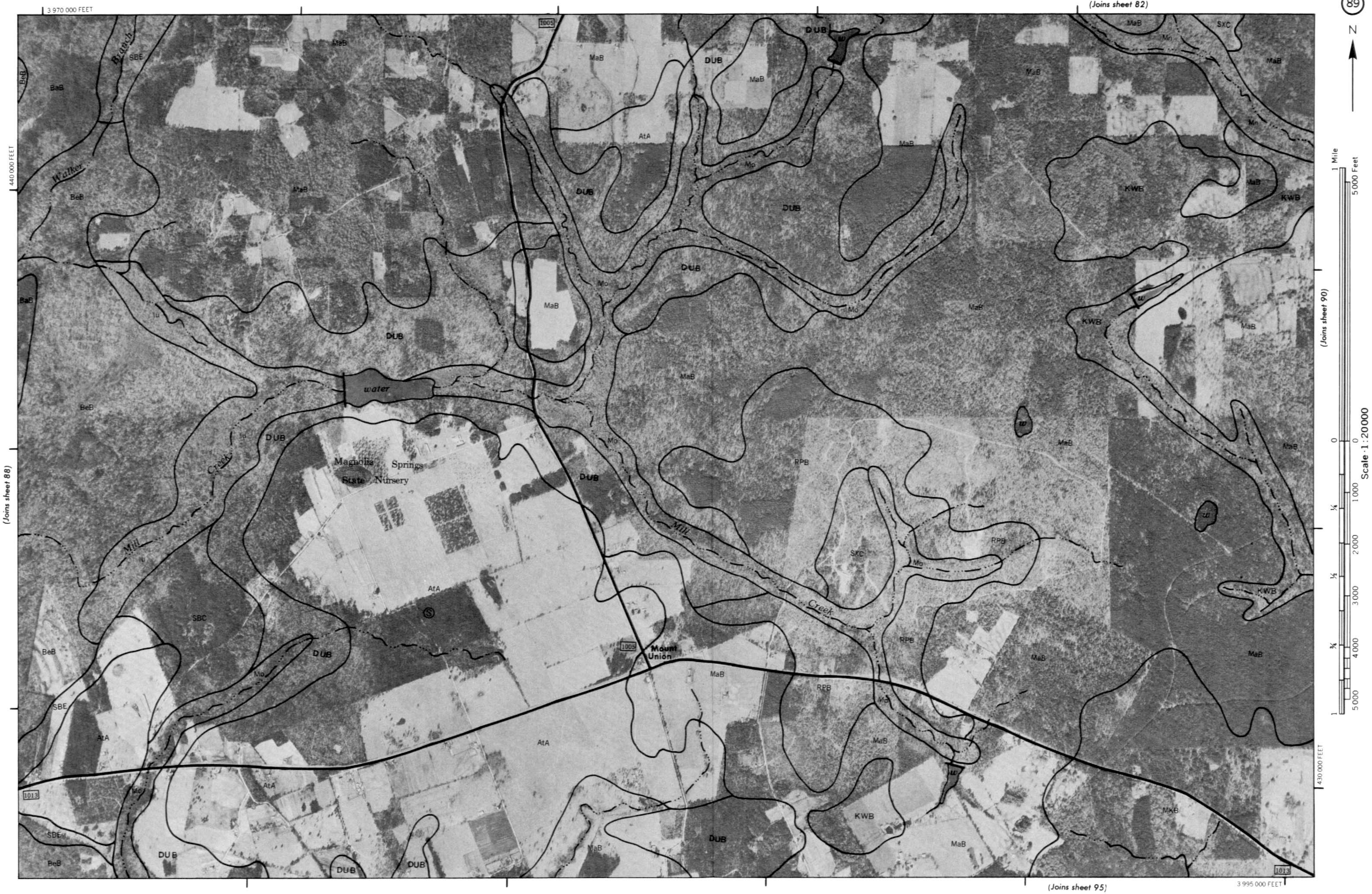



87
N
(Joins sheet 80)
(Joins sheet 86)
(Joins sheet 94)
4 095 000 FEET
4 115 000 FEET
465 000 FEET
455 000 FEET
1 Mile
5 000 Feet
Scale 1:20000
0
¼
½
¾
1
1000
2000
3000
4000
5000
water
Quicksand
Creek
Caney
Creek
Lost
Creek
Steamboat
Bend
SABINE
RIVER
LOUISIANA
BEAUREGARD
PARISH
Bon Wier
ATCHISON
TOPEKA
AND
SANTA FE
2626
190
363
1416
Mn
MaB
BaB
BeB
BlB
PlC
Um
AtA
KWB
w

JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 88



JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 89



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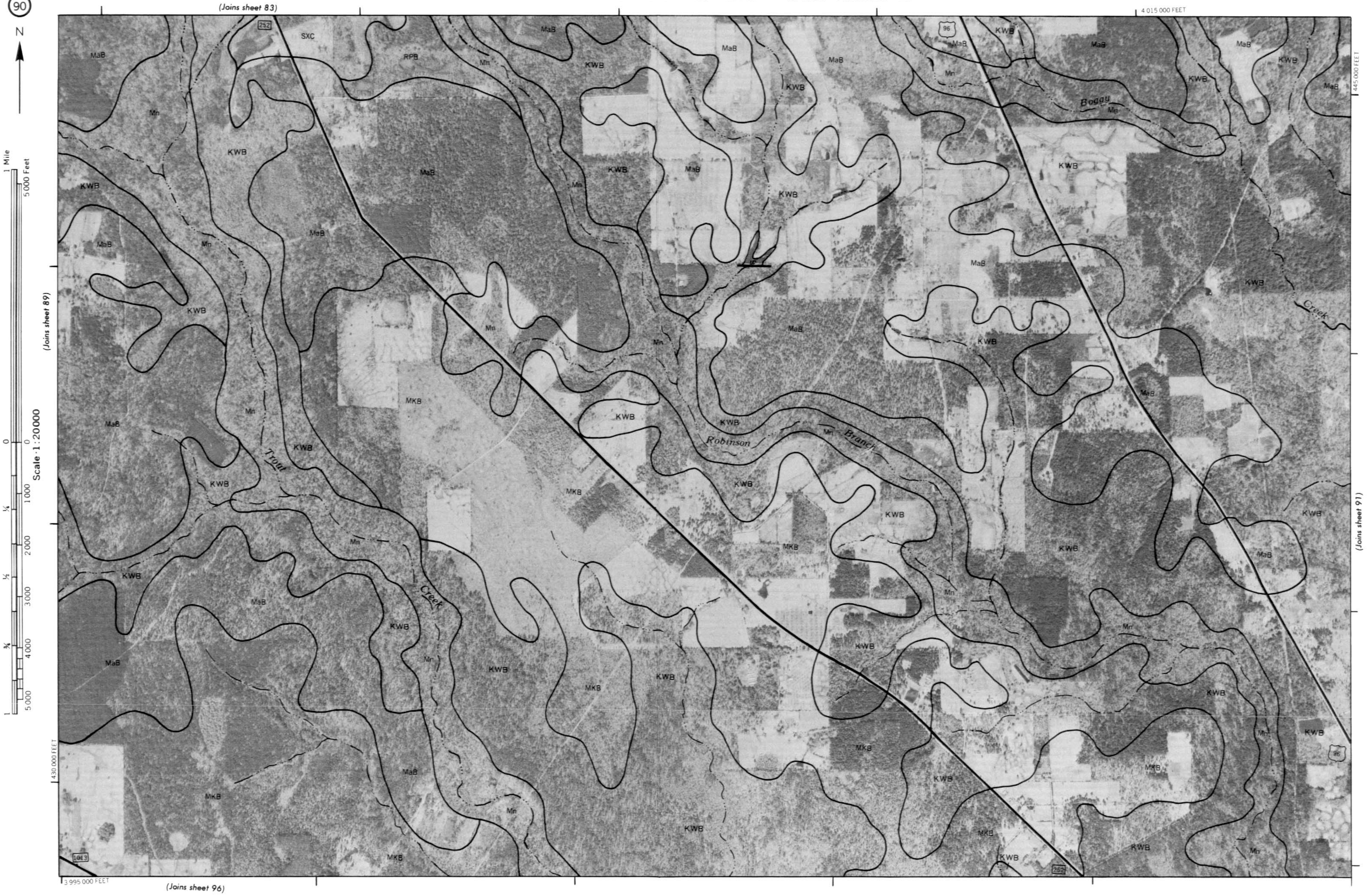
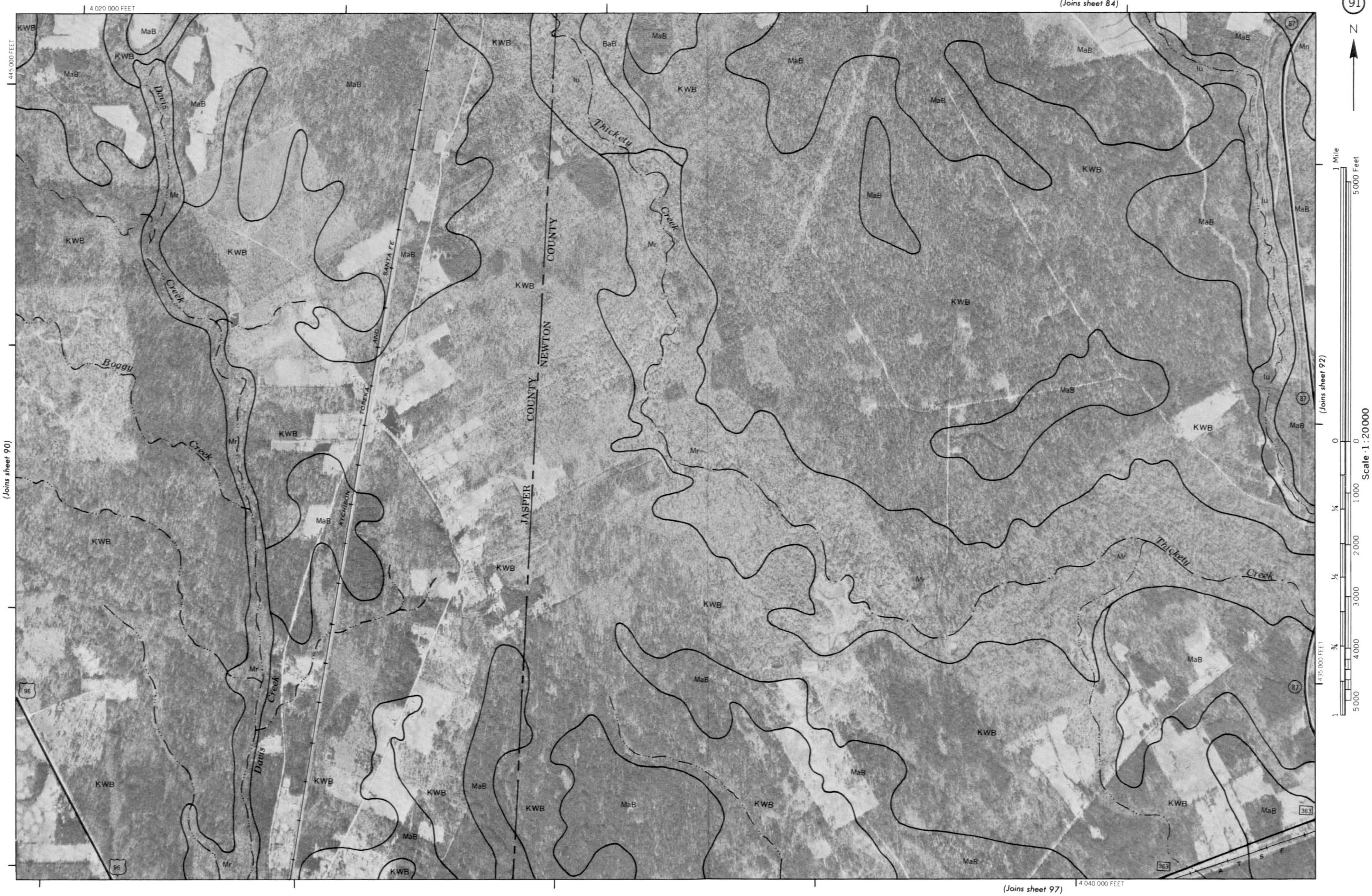
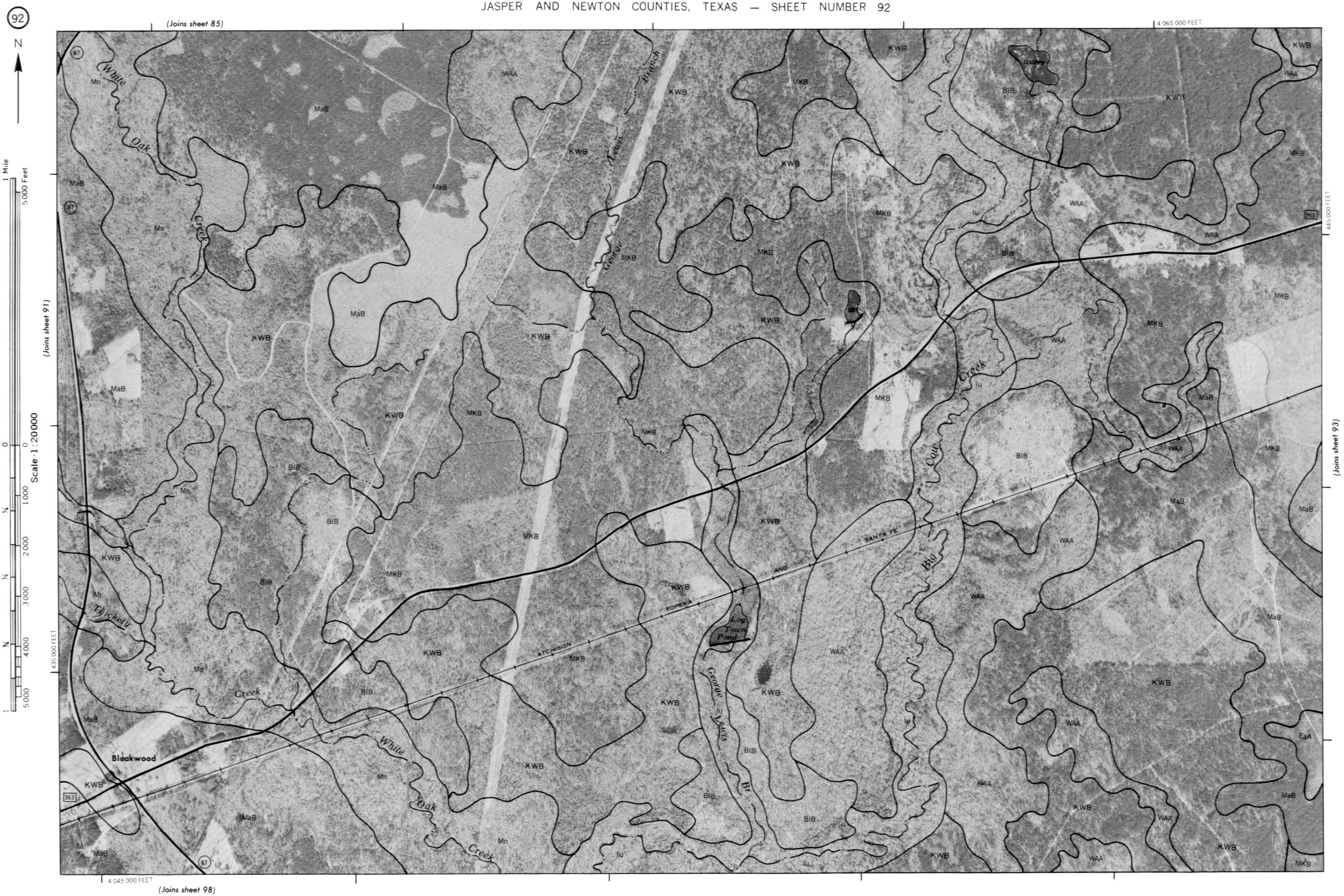
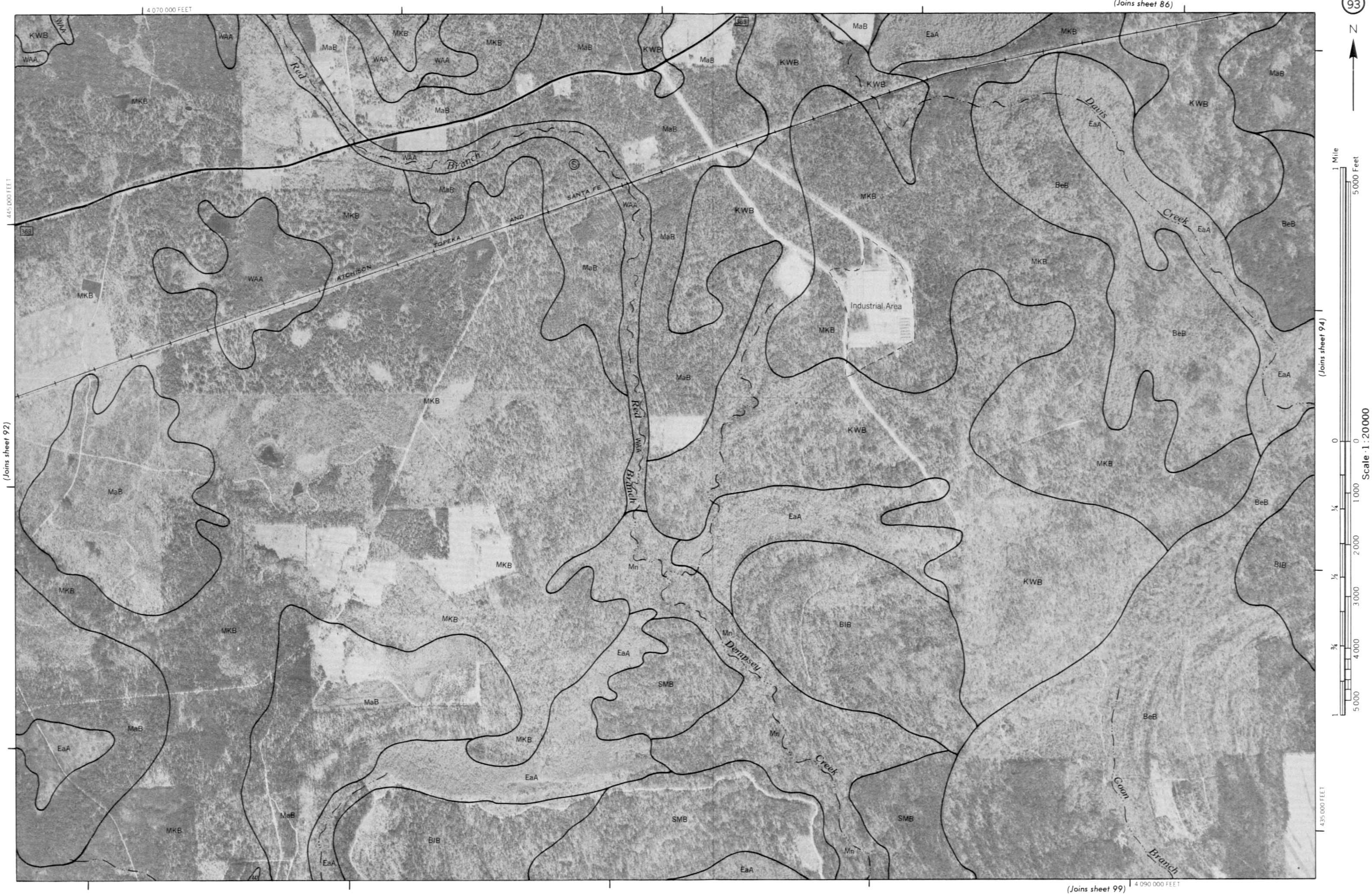
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 90

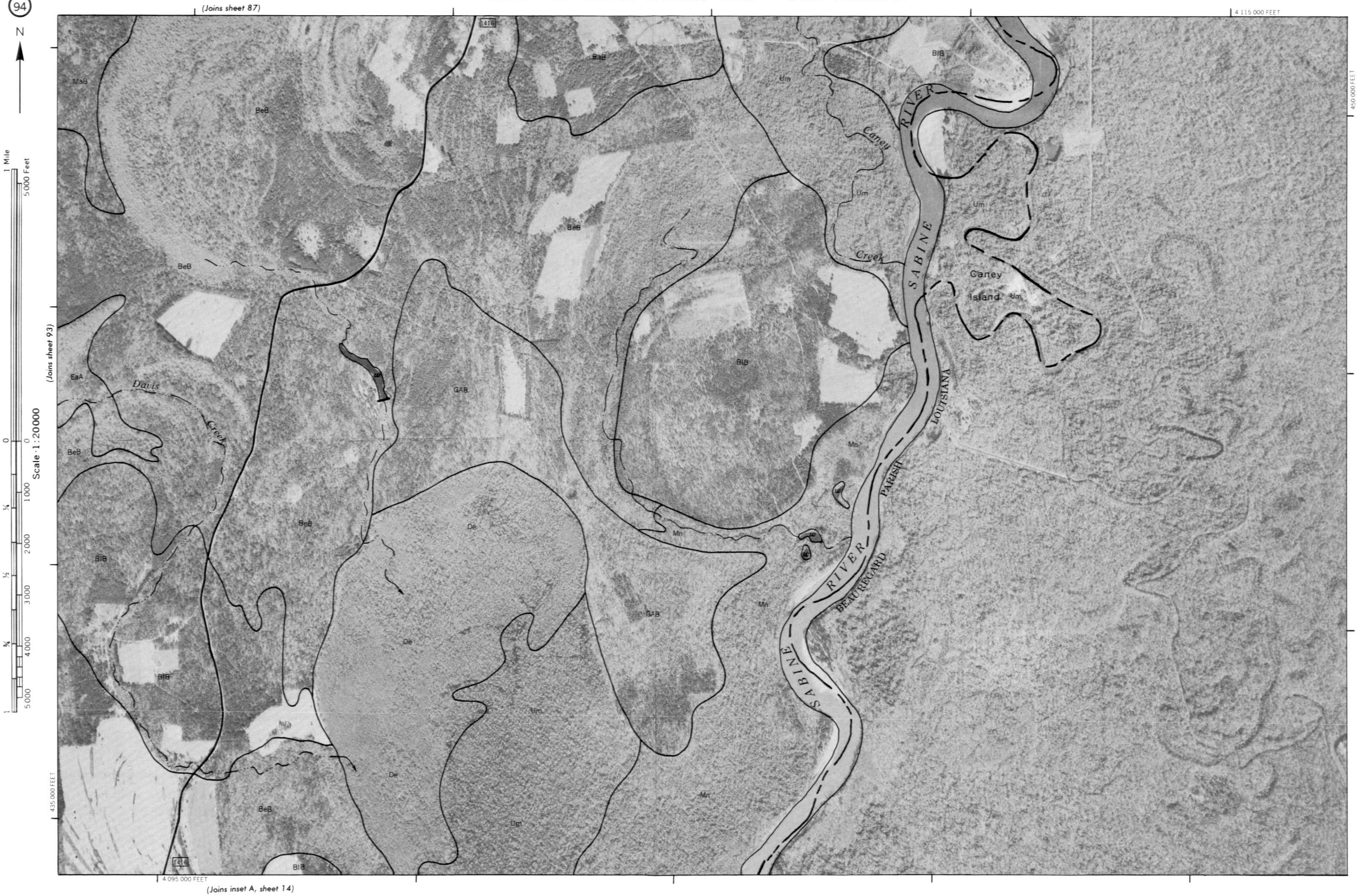


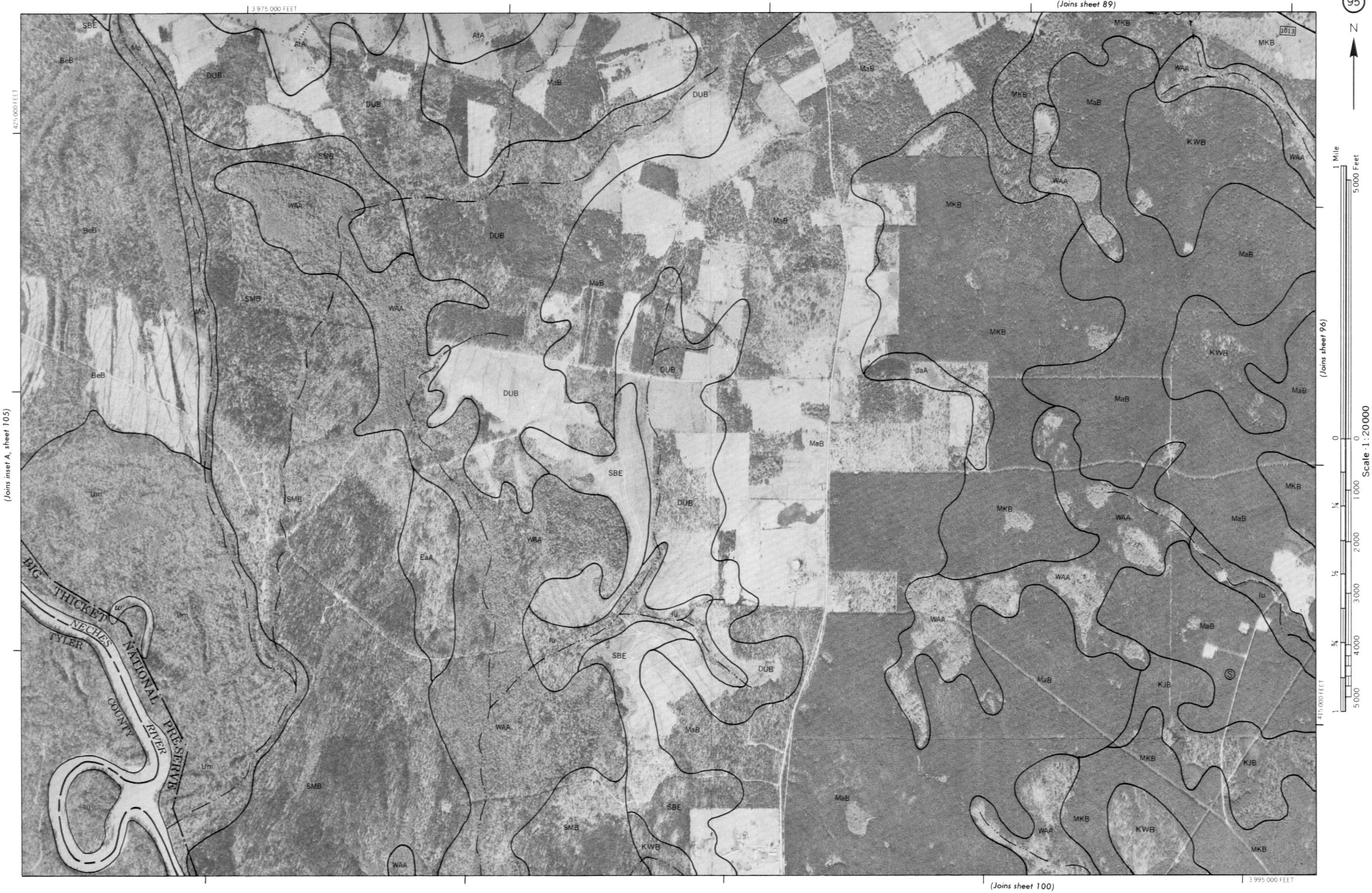

91
N
4 020 000 FEET
445 000 FEET
(Joins sheet 84)
(Joins sheet 90)
(Joins sheet 92)
(Joins sheet 97)
4 040 000 FEET
435 000 FEET
1 Mile
5 000 Feet
0
¼
½
¾
1
1000
2000
3000
4000
5000
Scale 1:20000
KWB
MaB
BaB
Iu
Mn
Mr
Davis Creek
Boggy Creek
Thickety Creek
ATCHISON TOPEKA AND SANTA FE
JASPER COUNTY
NEWTON COUNTY
96
87
363
A T S F


92
N
1 Mile
5 000 Feet
Scale 1:20000
0
¼
½
¾
1
0
1000
2000
3000
4000
5000
(Joins sheet 85)
(Joins sheet 91)
(Joins sheet 93)
(Joins sheet 98)
4 065 000 FEET
445 000 FEET
435 000 FEET
4 045 000 FEET
87
363
White Oak Creek
Thickety Creek
George Lewis Branch
George Lewis Br
Big Cow Creek
Log Tourn Pond
water
Bleakwood
ATCHISON TOPEKA AND SANTA FE
Mn
MaB
KWB
WAA
MKB
BIB
Iu
EaA


4 070 000 FEET
(Joins sheet 86)
N
445 000 FEET
(Joins sheet 92)
(Joins sheet 94)
(Joins sheet 99)
4 090 000 FEET
435 000 FEET
1 Mile
5000 Feet
0
¼
½
¾
1
1000
2000
3000
4000
5000
Scale 1:20000
365
369
ATCHISON
TOPEKA
AND
SANTA FE
Red
Branch
Red
Branch
Davis
Creek
Dempsey
Creek
Coon
Branch
Industrial Area
S
KWB
WAA
MaB
MKB
EaA
BeB
BIB
SMB
Mn

JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 94




95
N
3 975 000 FEET
(Joins sheet 89)
1013
425 000 FEET
(Joins inset A, sheet 105)
(Joins sheet 96)
415 000 FEET
(Joins sheet 100)
3 995 000 FEET
1 Mile
5000 Feet
0
¼
½
¾
1
0
1000
2000
3000
4000
5000
Scale 1:20000
BIG THICKET NATIONAL PRESERVE
NECHES RIVER
TYLER COUNTY
SBE
BeB
Mp
DUB
AtA
AtA
MaB
DUB
DUB
MaB
MKB
MKB
WAA
MKB
MaB
KWB
WAA
WAA
SMB
WAA
BeB
DUB
MaB
MKB
MaB
SMB
WAA
Mp
MaB
MKB
KWB
BeB
DUB
JaA
DUB
MaB
MaB
Um
SBE
MaB
MKB
SMB
DUB
MKB
WAA
MaB
WAA
EaA
WAA
Iu
Um
Iu
Iu
WAA
MaB
SBE
DUB
MaB
KJB
MaB
SMB
WAA
MaB
MKB
KJB
Um
Iu
SBE
MaB
SMB
WAA
KWB
MKB
WAA
KWB
MKB
Iu

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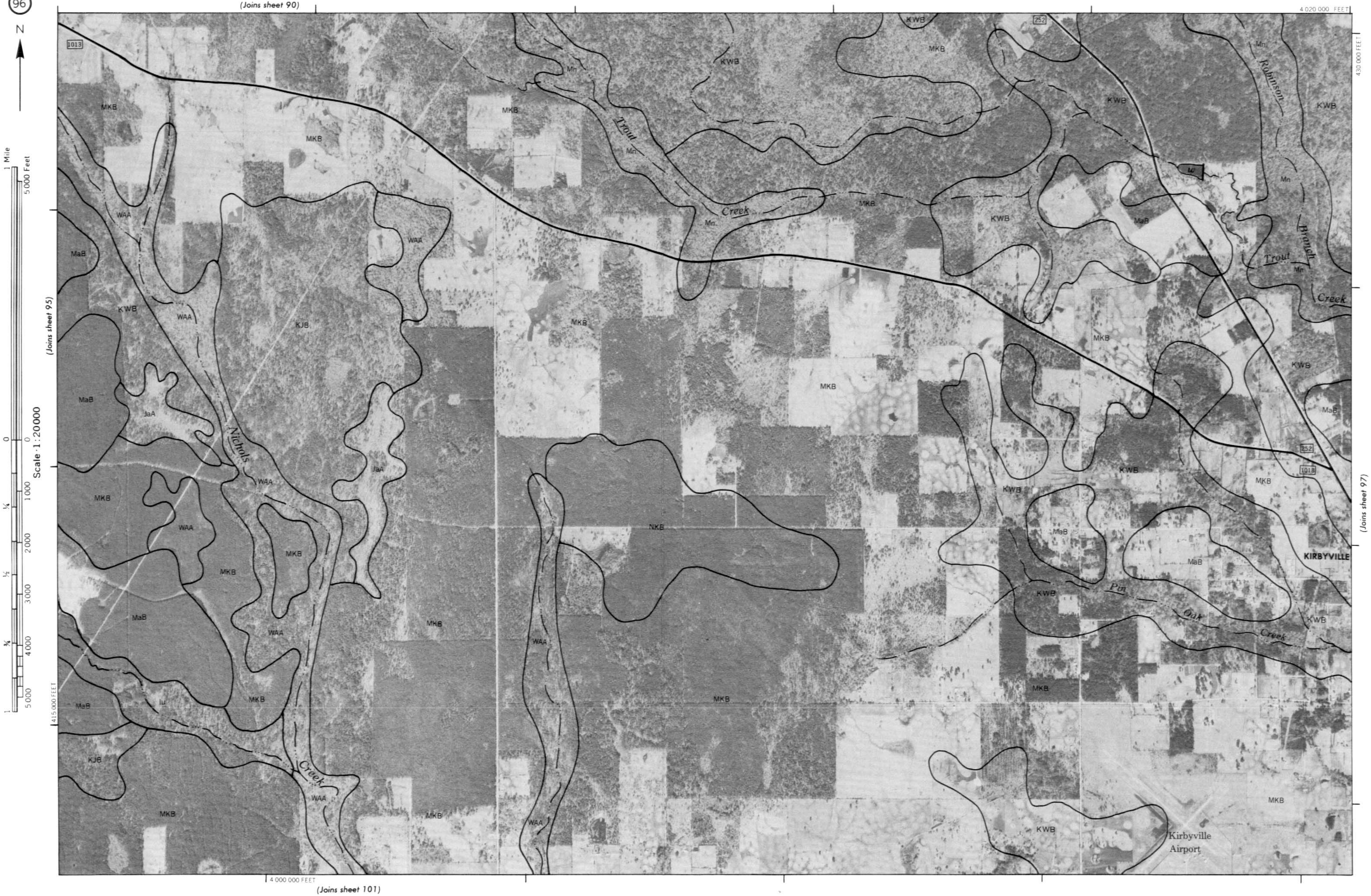
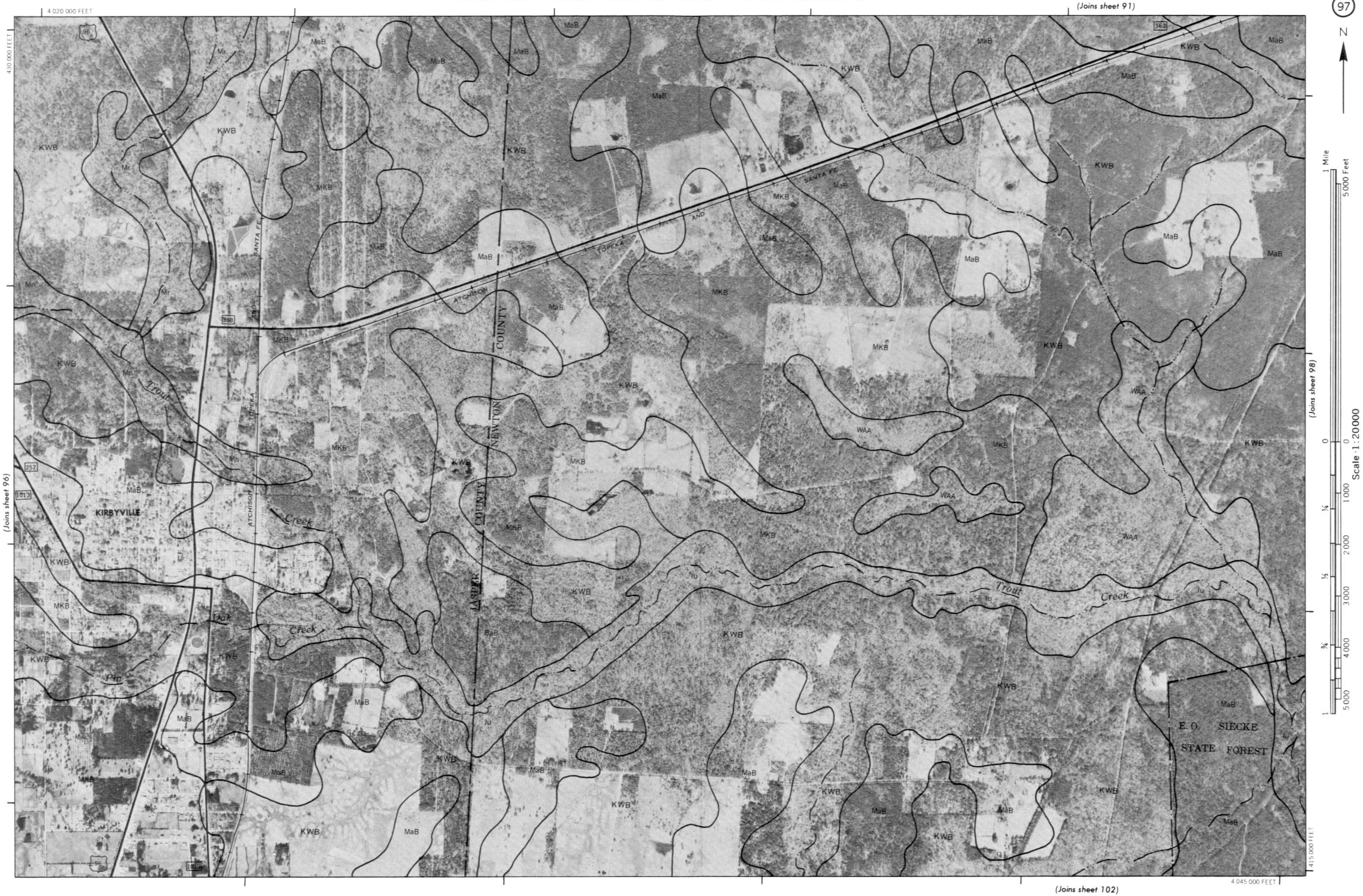
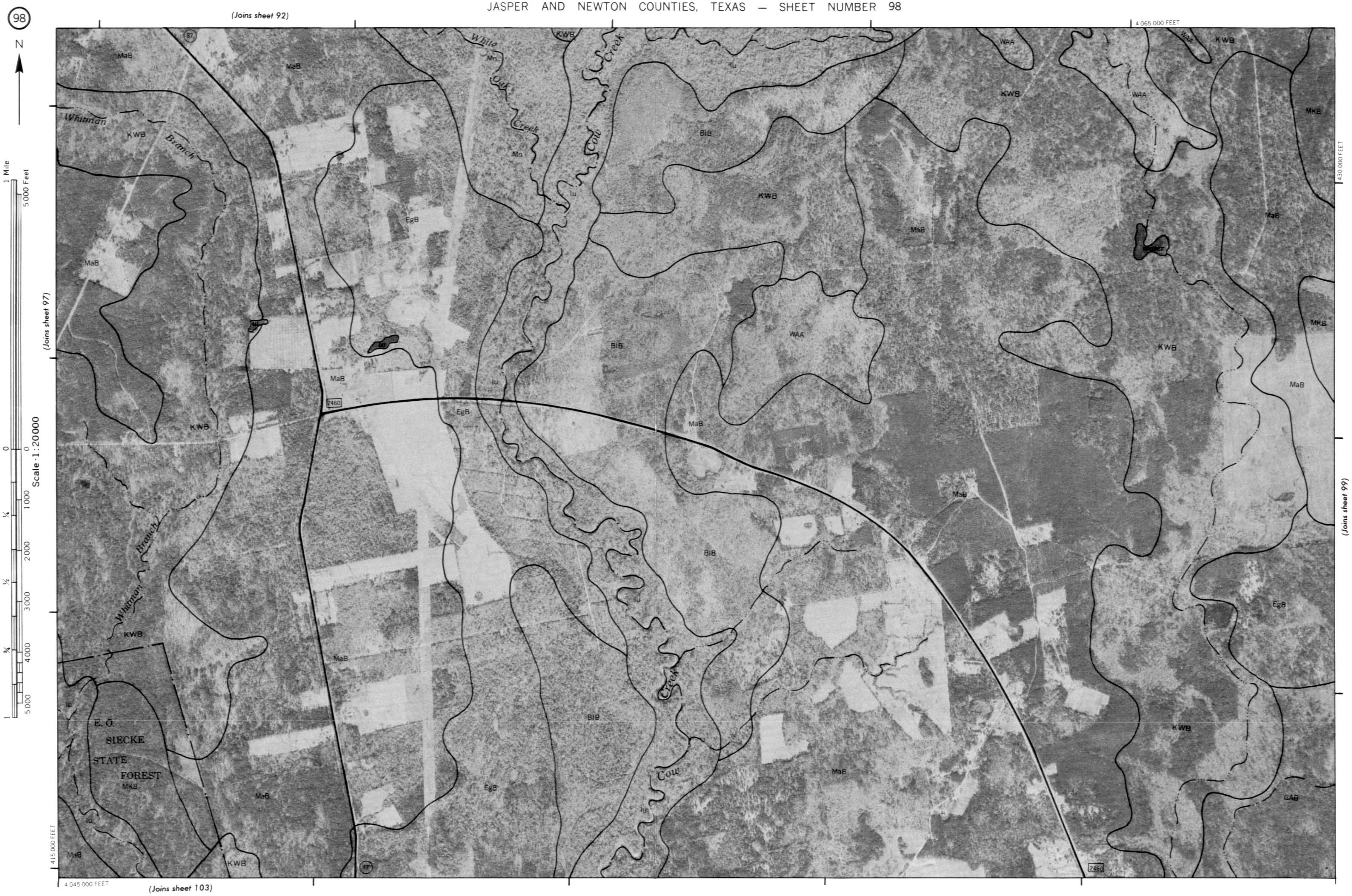
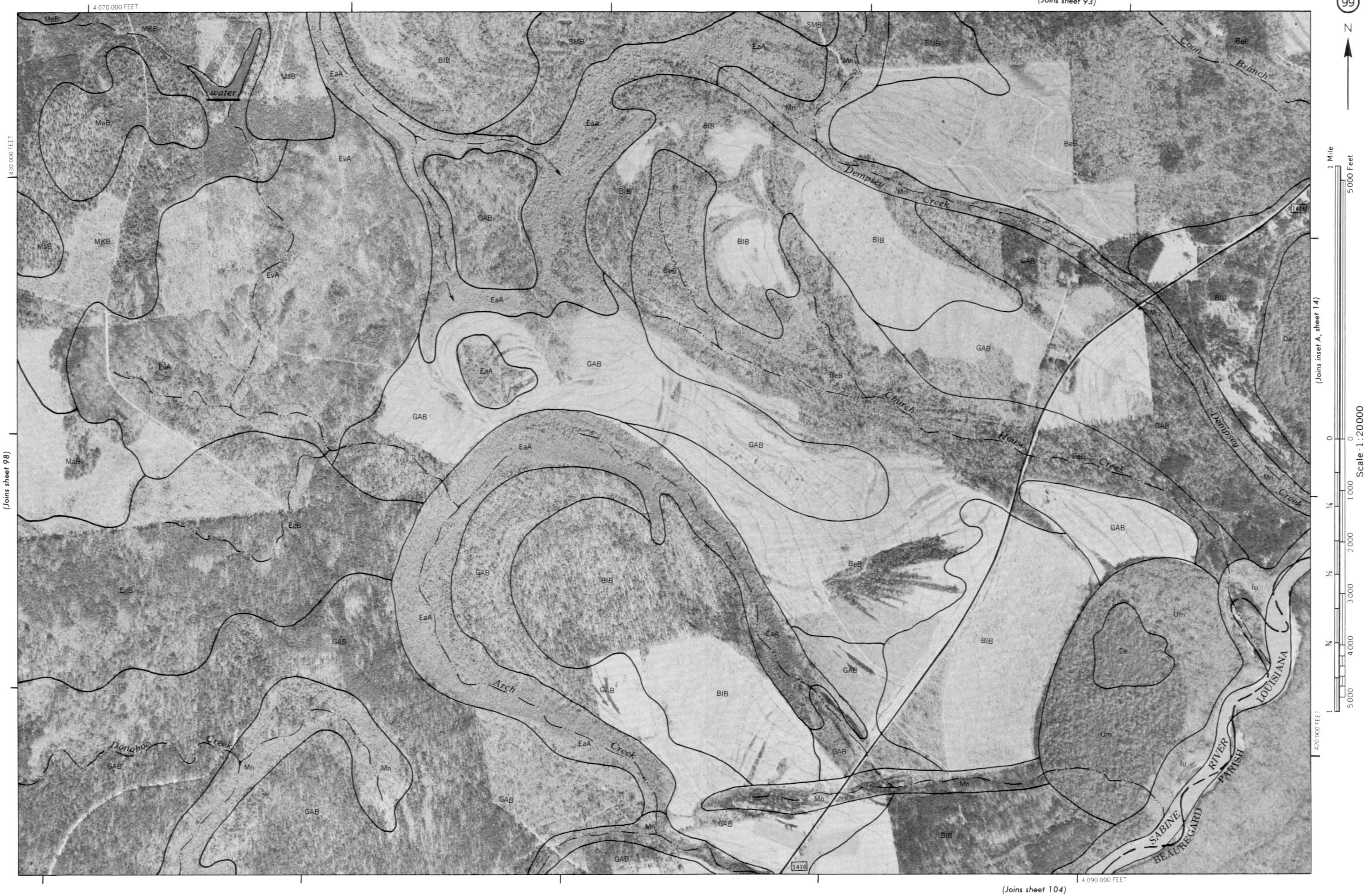
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 96

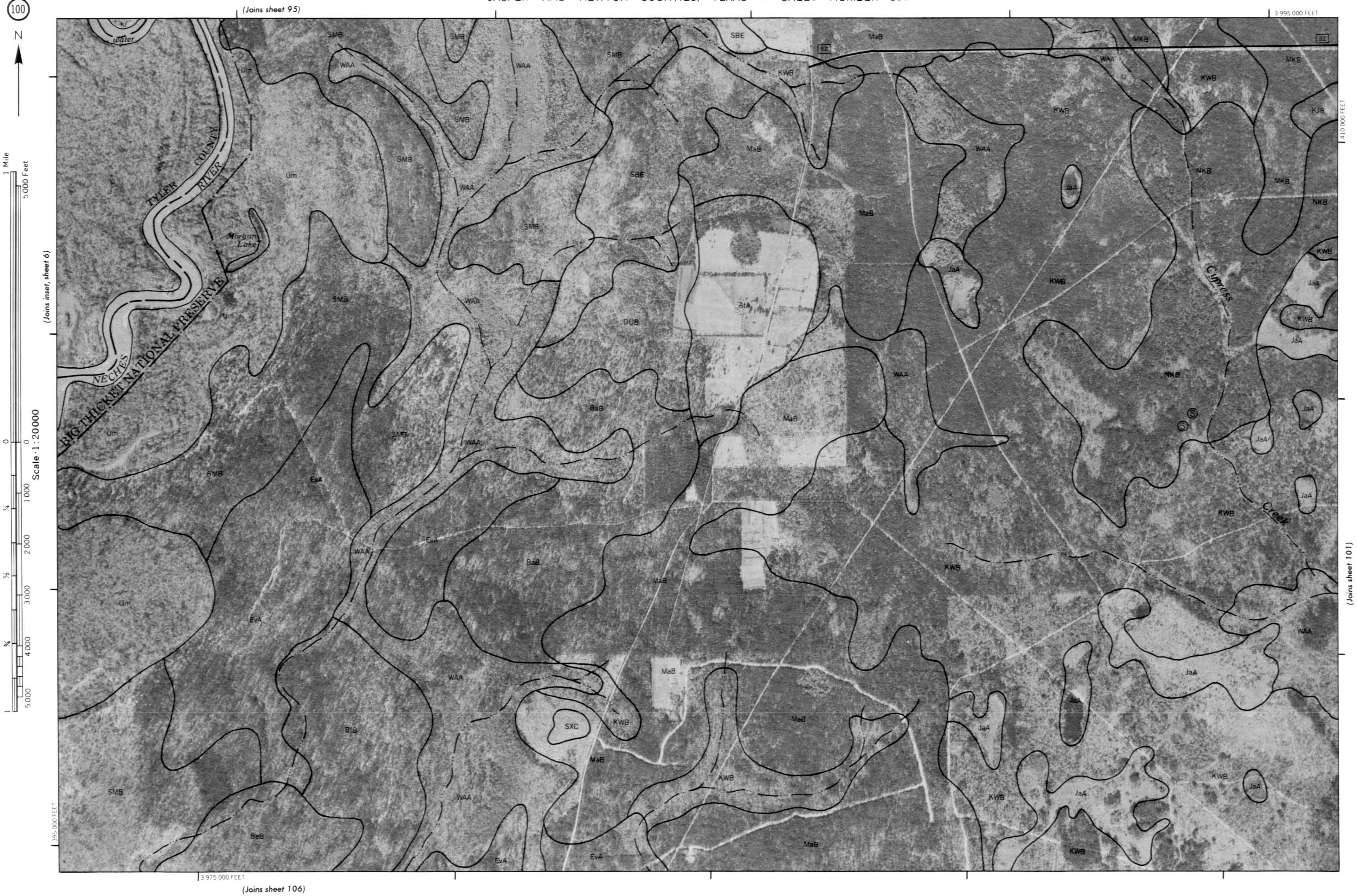



97
(Joins sheet 91)
(Joins sheet 96)
(Joins sheet 98)
(Joins sheet 102)
4 020 000 FEET
430 000 FEET
415 000 FEET
4 045 000 FEET
N
1 Mile
5000 Feet
Scale 1:20000
0
1000
2000
3000
4000
5000
¼
½
¾
1
KIRBYVILLE
E. O. SIECKE STATE FOREST
JASPER COUNTY
NEWTON COUNTY
ATCHISON TOPEKA AND SANTA FE
Trout Creek
Oak Creek
Pin
96
363
252
1013
898
1004
KWB
MaB
MKB
Mr
WAA
Iu
BaB

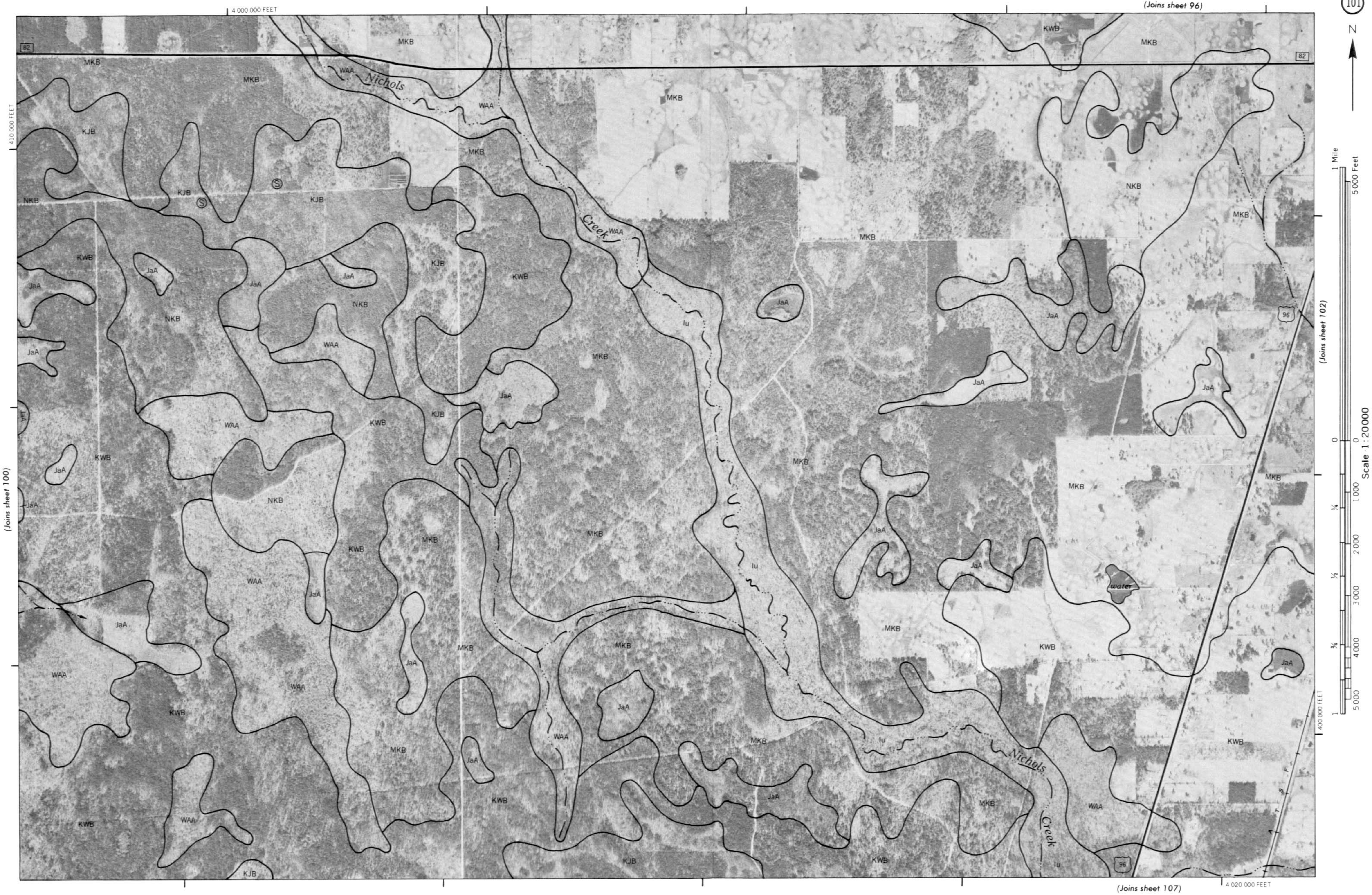

98
N
(Joins sheet 92)
(Joins sheet 97)
(Joins sheet 99)
(Joins sheet 103)
4 065 000 FEET
430 000 FEET
415 000 FEET
4 045 000 FEET
1 Mile
5000 Feet
Scale 1:20000
0
¼
½
¾
1
0
1000
2000
3000
4000
5000
White Oak Creek
Cow Creek
Whitman Branch
E. O. SIECKE STATE FOREST
87
2460
MaB
KWB
EgB
BlB
Mn
Iu
WAA
MKB
GAB

JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 99



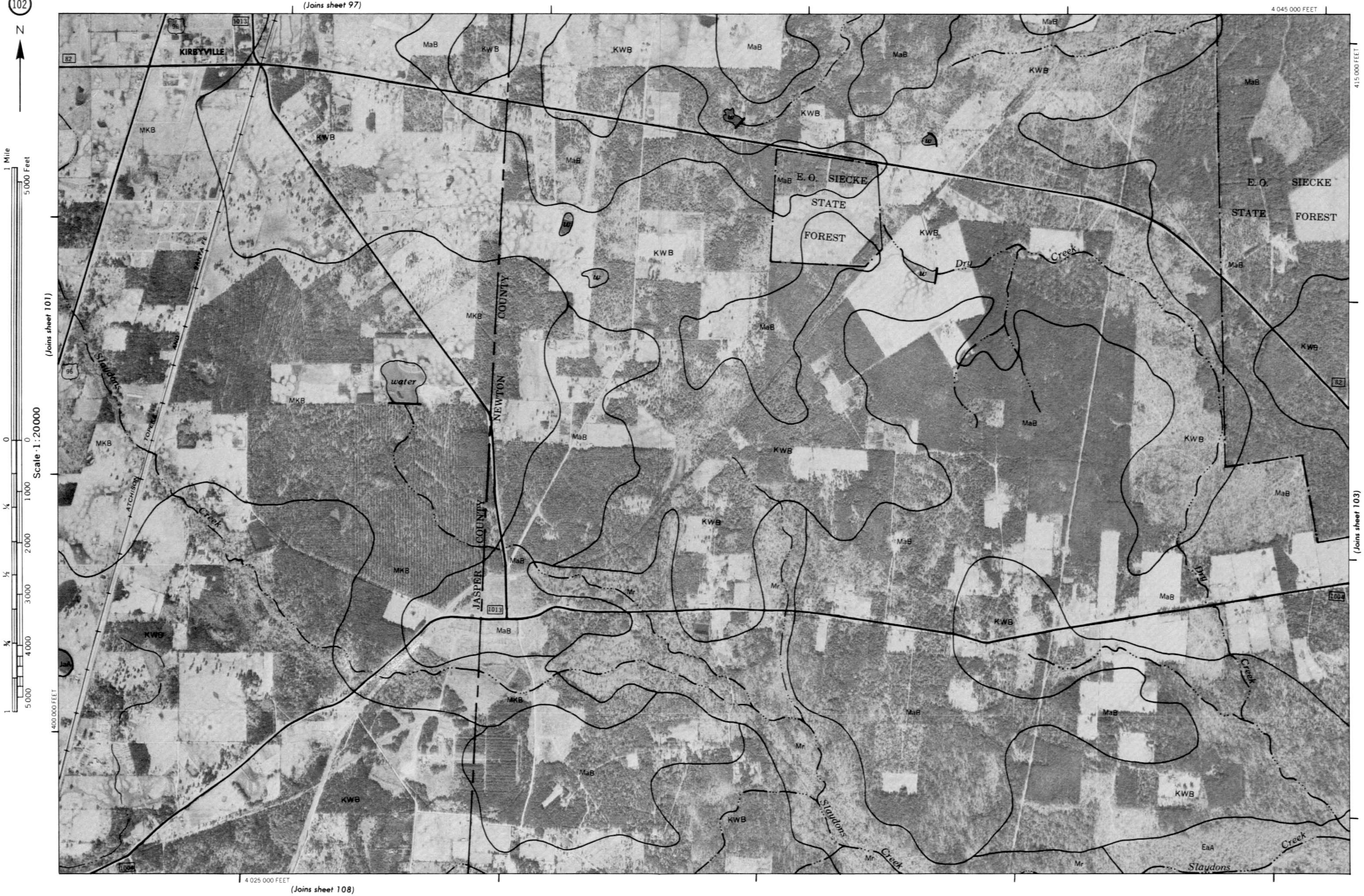

(100)
N
(Joins sheet 95)
(Joins sheet 106)
(Joins inset, sheet 6)
(Joins sheet 101)
3 995 000 FEET
410 000 FEET
395 000 FEET
3 975 000 FEET
1 Mile
5000 Feet
Scale 1:20000
0
1000
2000
3000
4000
5000
¼
½
¾
1
0
82
TYLER COUNTY
NECHES RIVER
BIG THICKET NATIONAL PRESERVE
Morgan Lake
water
Cypress Creek
Um
SMB
WAA
SBE
MaB
KWB
MKB
KJB
NKB
JaA
AtA
DUB
BaB
EvA
BlB
BeB
SXC
S

JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 101

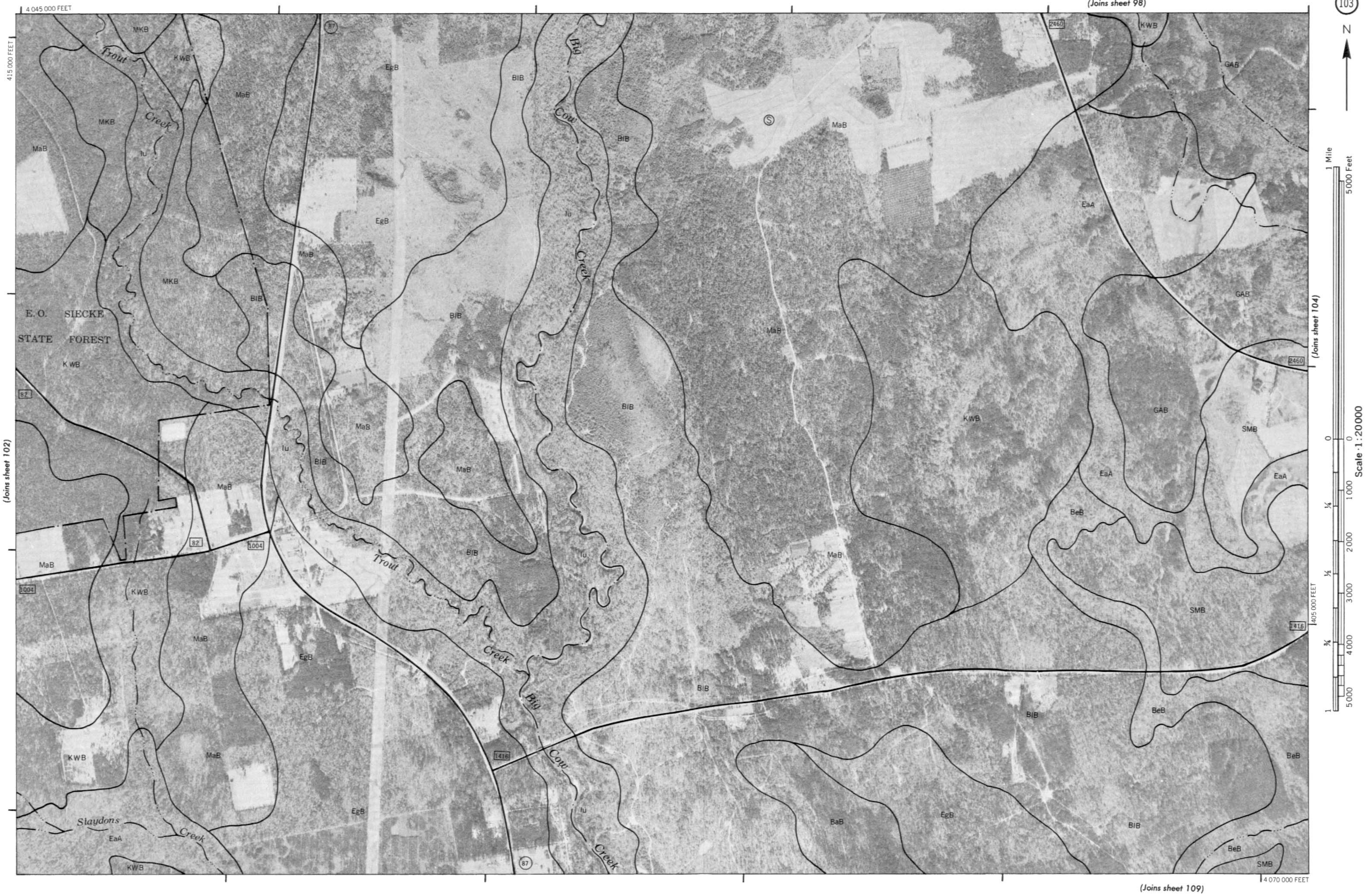


(102)

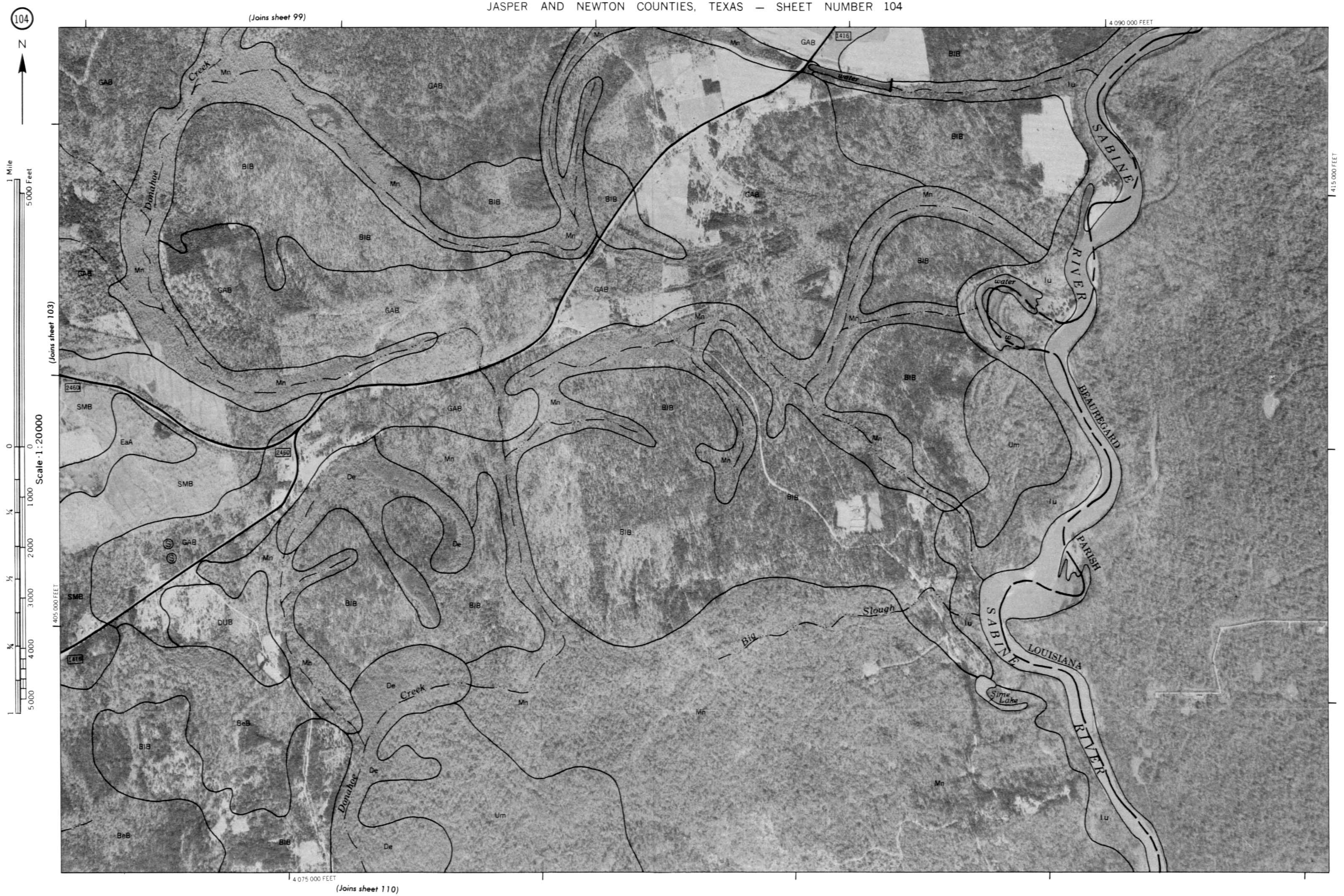
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 102

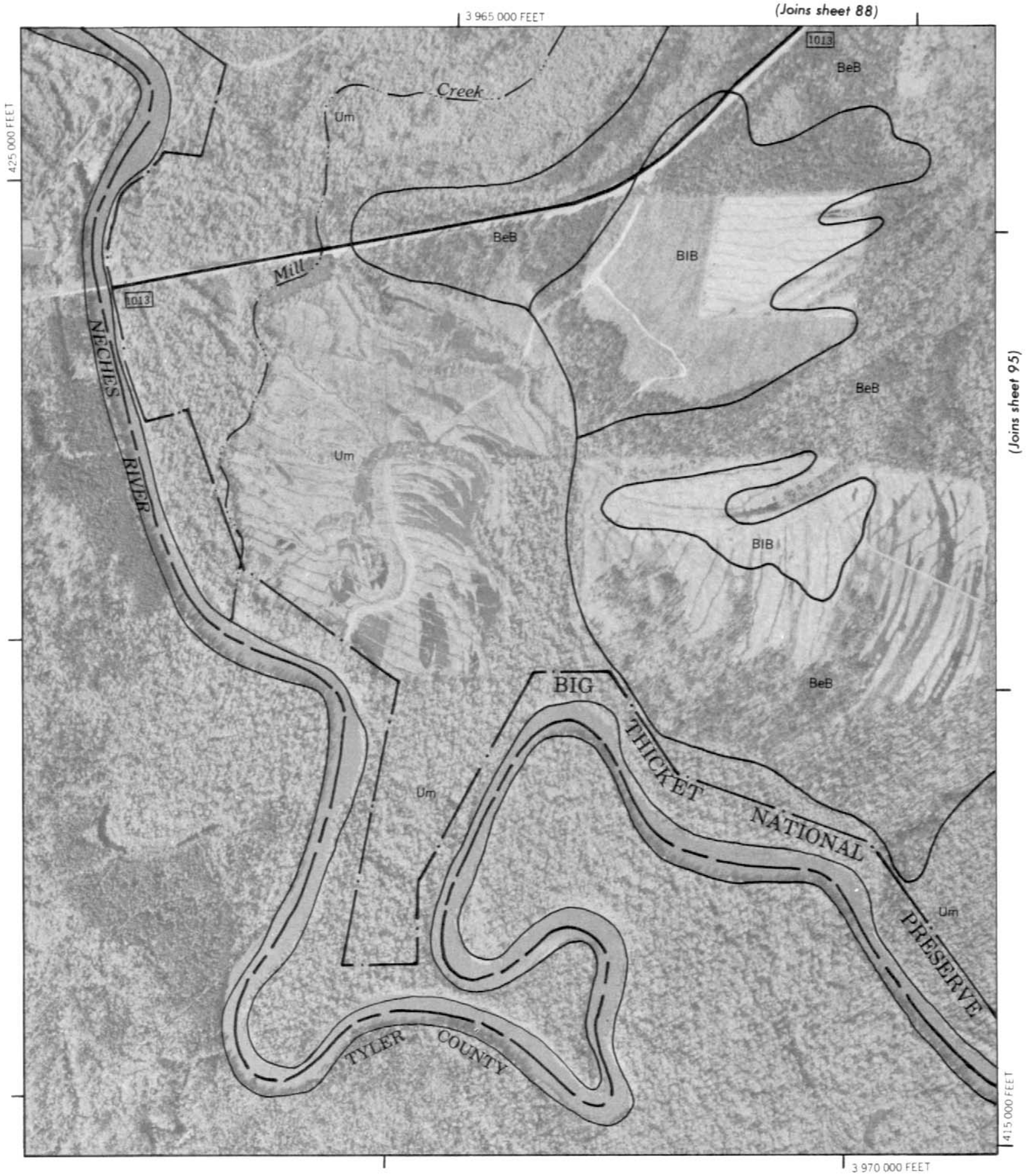


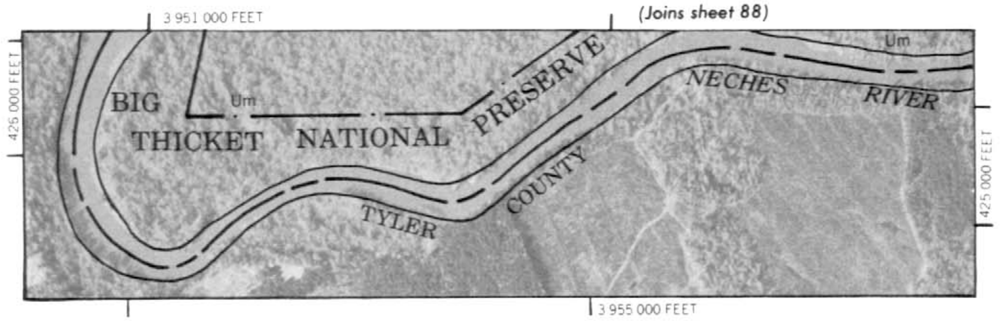
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 103

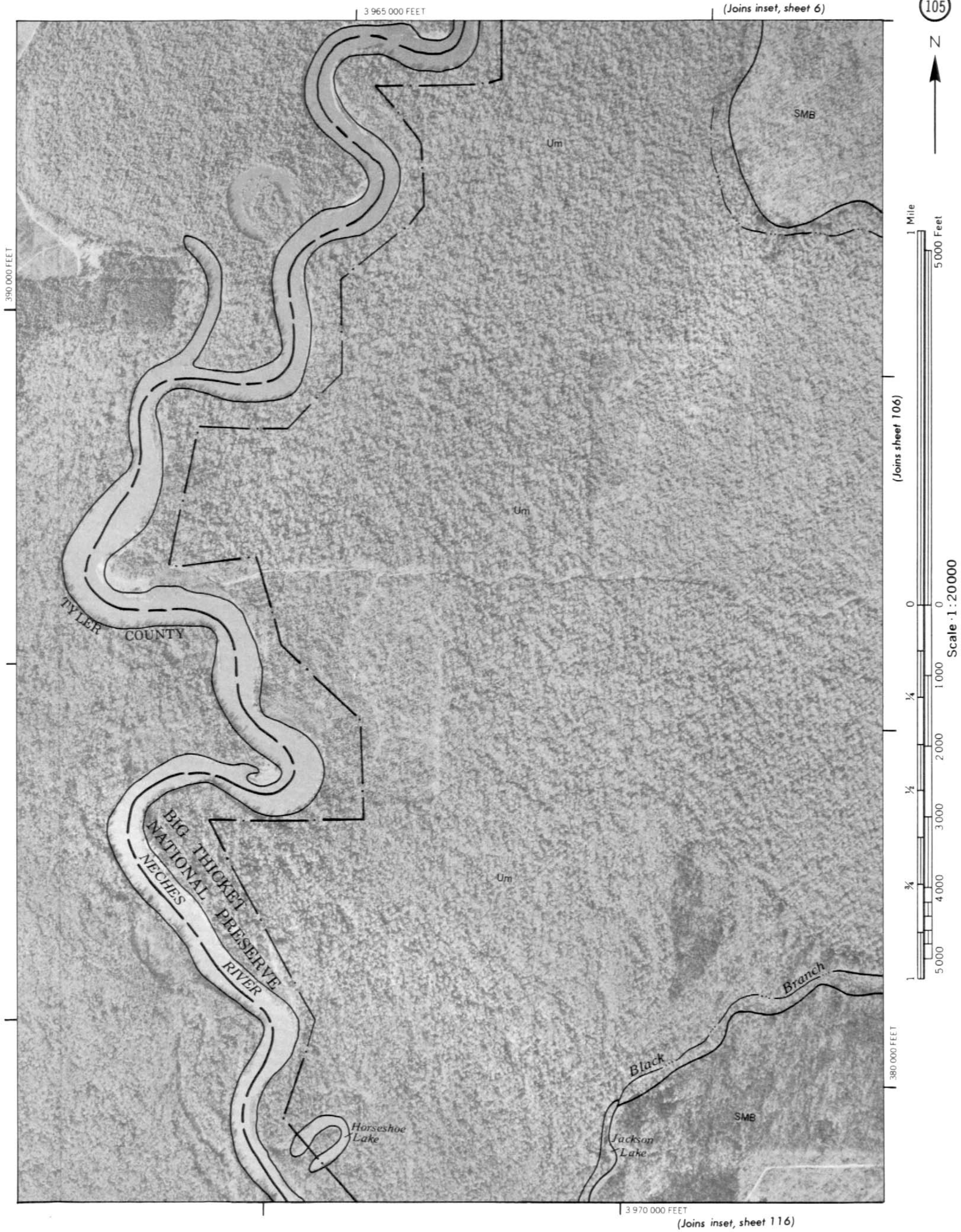


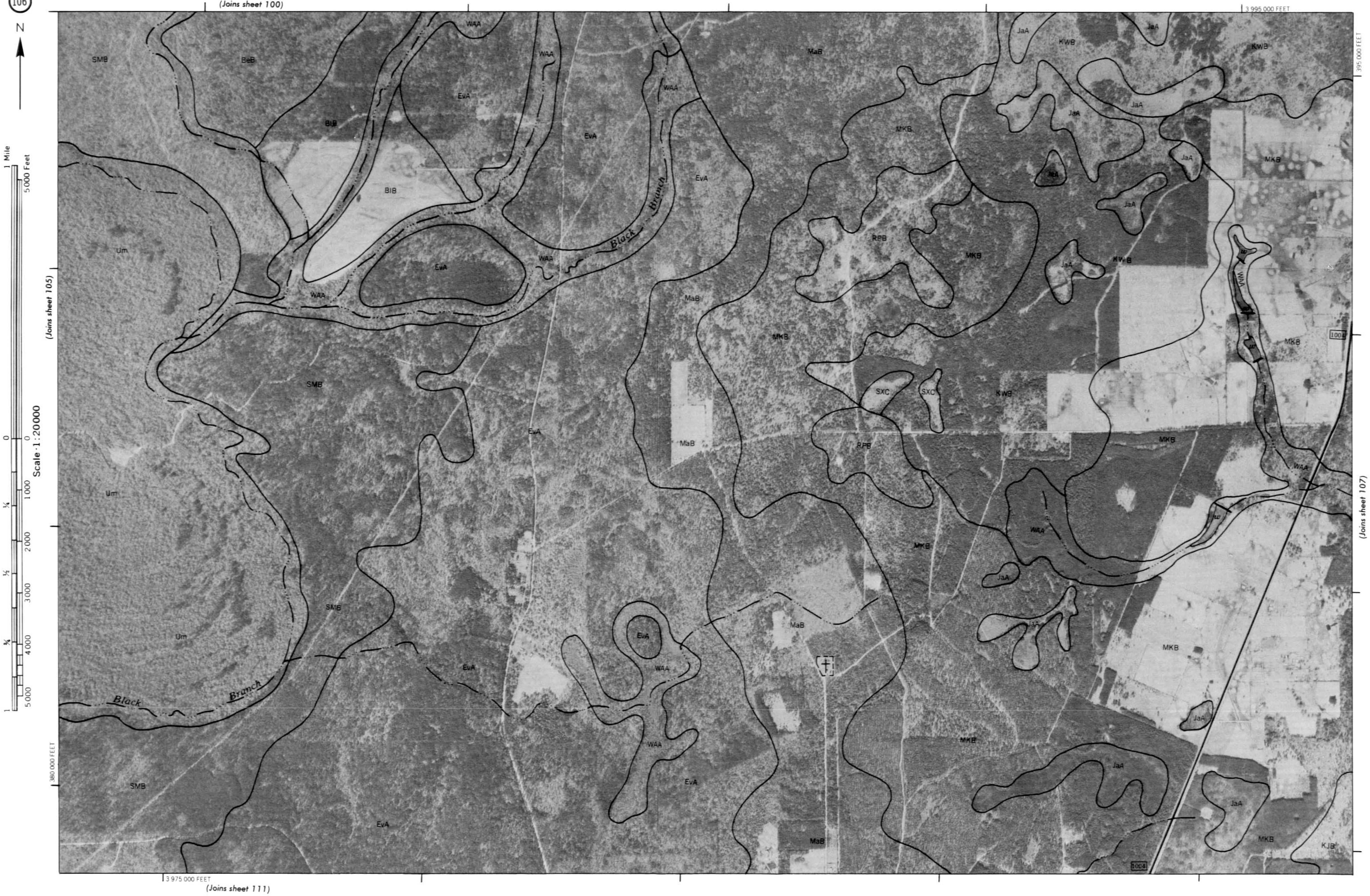
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 104



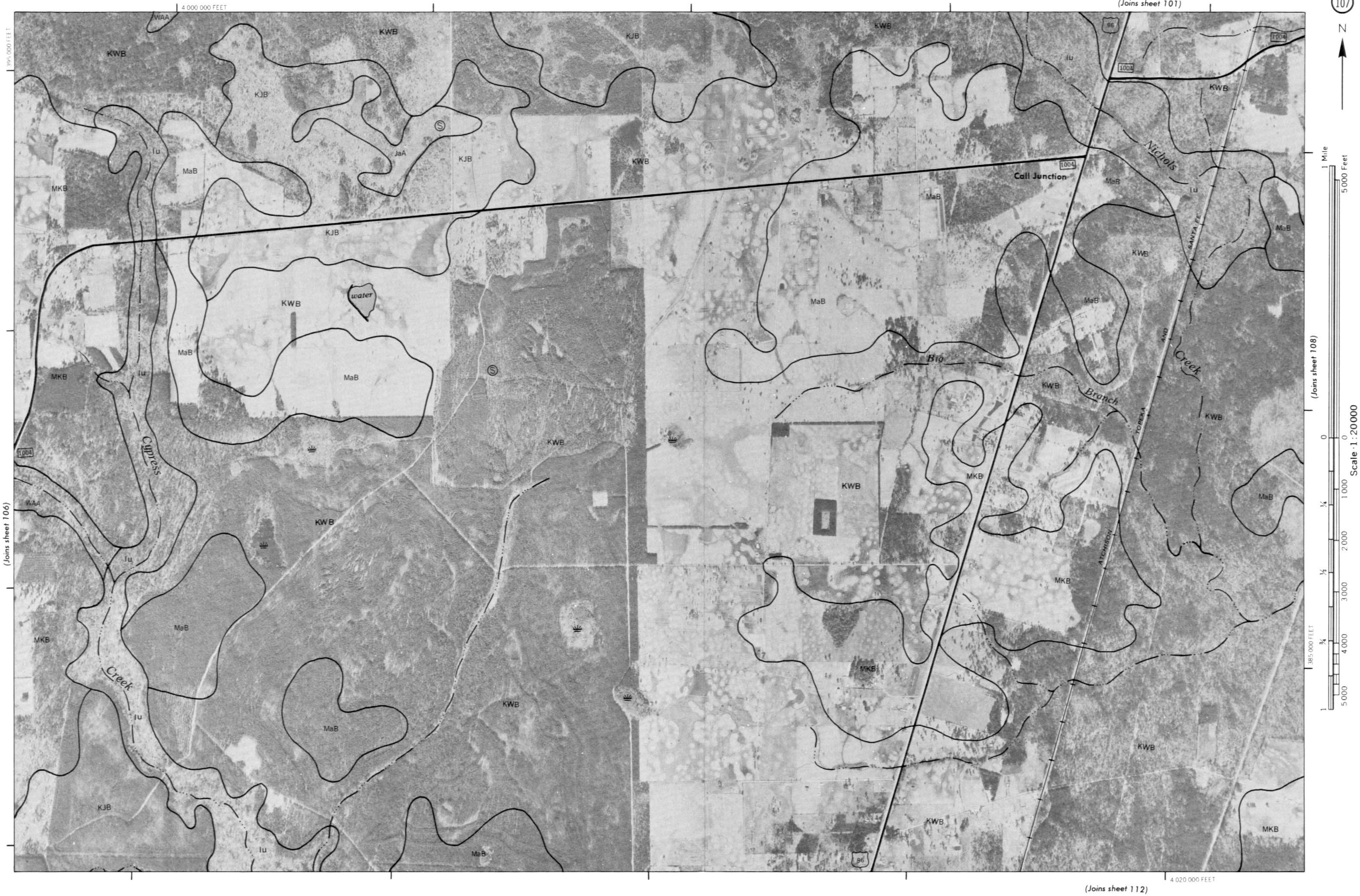

3 965 000 FEET
(Joins sheet 88)
1013
BeB
Creek
Um
425 000 FEET
BeB
BIB
Mill
1013
NECHES
RIVER
BeB
(Joins sheet 95)
Um
BIB
BIG
THICKET
NATIONAL
PRESERVE
BeB
Um
Um
TYLER
COUNTY
415 000 FEET
3 970 000 FEET


3 951 000 FEET
(Joins sheet 88)
425 000 FEET
Um
Um
BIG
THICKET
NATIONAL
PRESERVE
NECHES
RIVER
TYLER
COUNTY
425 000 FEET
3 955 000 FEET

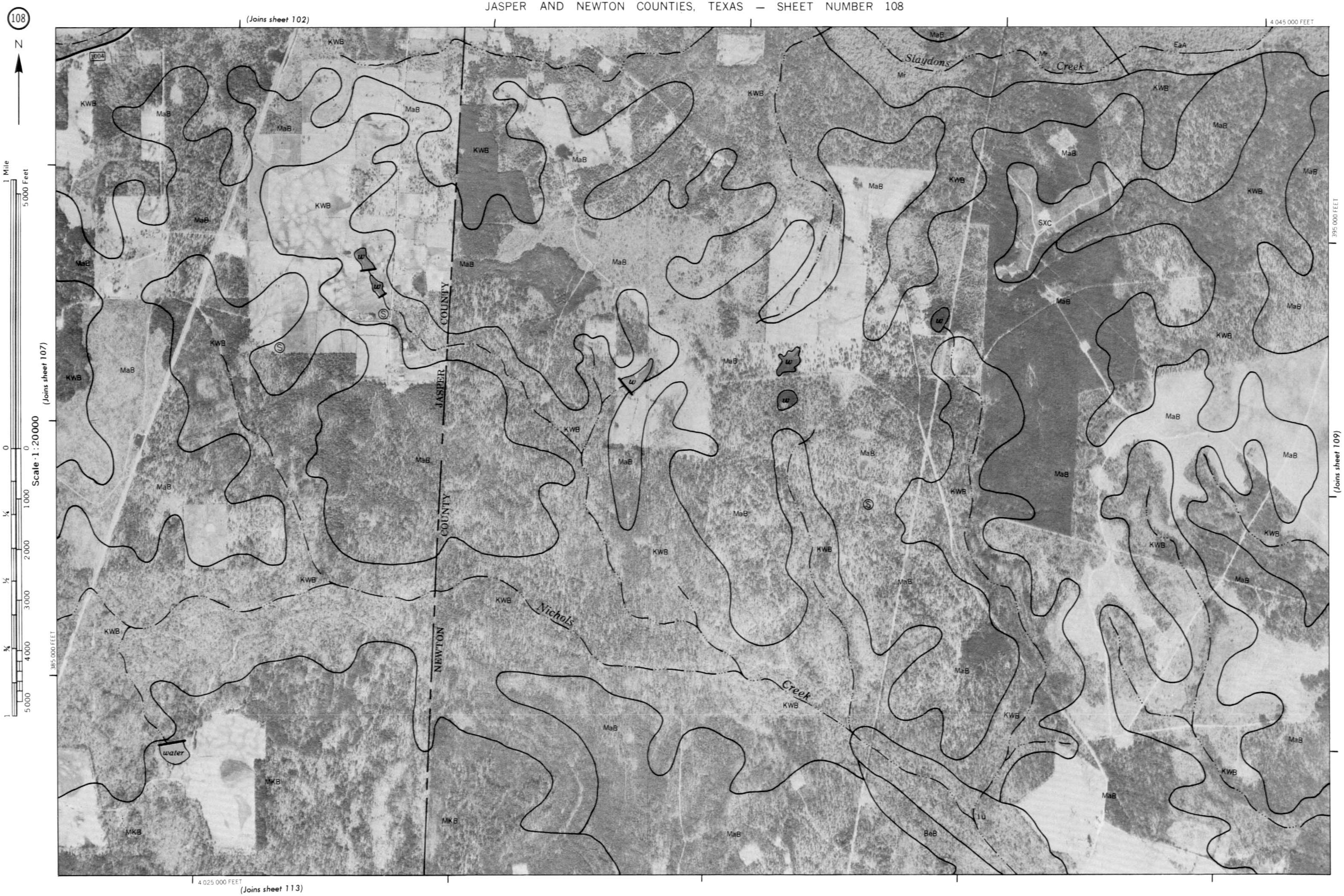

3 965 000 FEET
(Joins inset, sheet 6)
N
SMB
Um
390 000 FEET
1 Mile
5 000 Feet
(Joins sheet 106)
Um
TYLER
COUNTY
0
¼
½
¾
1
0
1 000
2 000
3 000
4 000
5 000
Scale 1:20000
BIG
THICKET
NATIONAL
PRESERVE
NECHES
RIVER
Um
Branch
Black
380 000 FEET
SMB
Horseshoe
Lake
Jackson
Lake
3 970 000 FEET
(Joins inset, sheet 116)

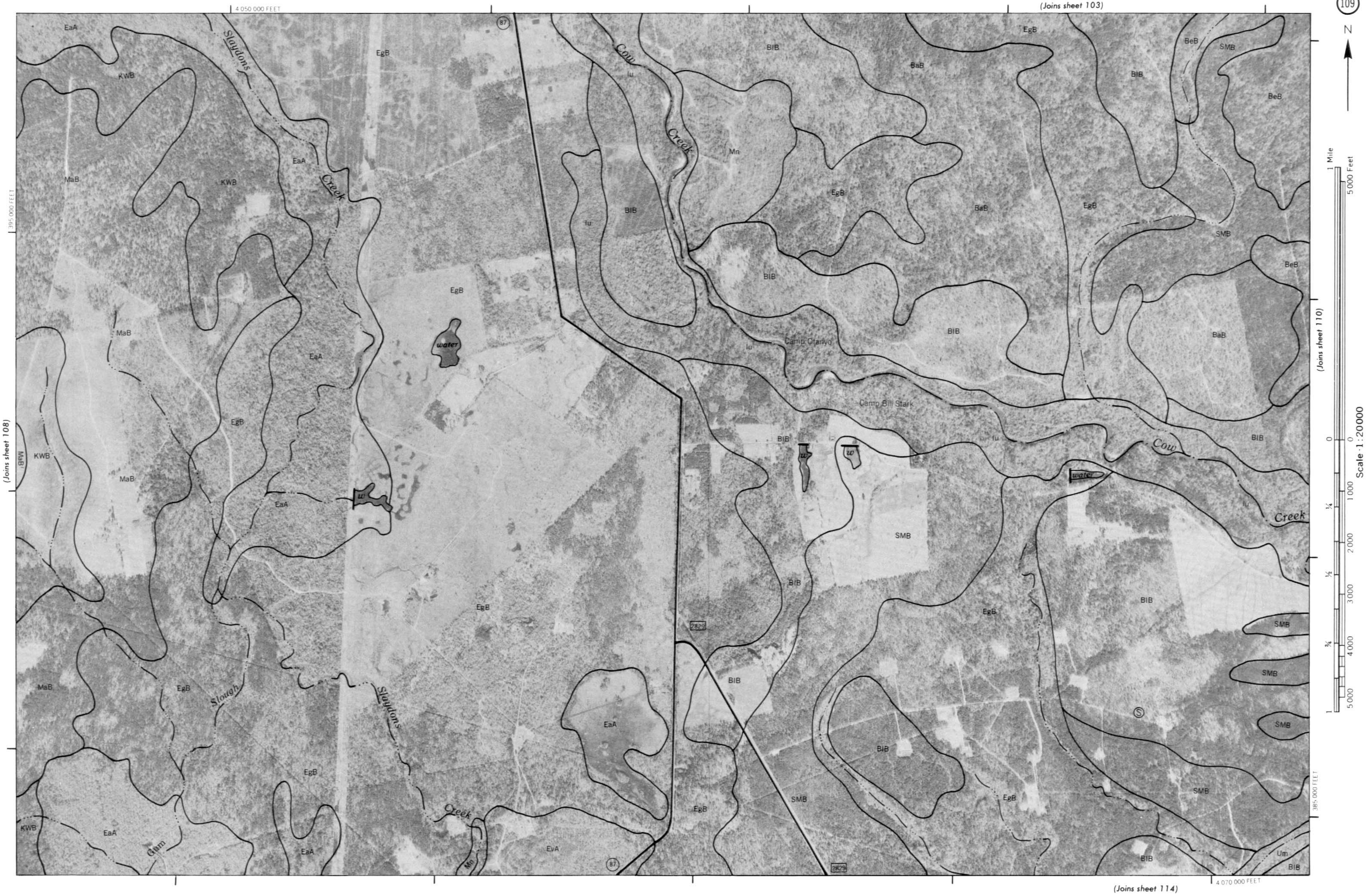

N
(Joins sheet 100)
3 995 000 FEET
395 000 FEET
(Joins sheet 105)
(Joins sheet 107)
(Joins sheet 111)
3 975 000 FEET
380 000 FEET
1 Mile
5 000 Feet
Scale 1:20000
0
¼
½
¾
1
0
1000
2000
3000
4000
5000
SMB
BeB
WAA
EvA
BlB
BlB
Um
Um
Um
SMB
SMB
SMB
EvA
EvA
EvA
EvA
EvA
EvA
EvA
WAA
WAA
WAA
WAA
WAA
WAA
Black Branch
Black Branch
MaB
MaB
MaB
MaB
MaB
MKB
MKB
MKB
MKB
MKB
MKB
MKB
MKB
RPB
RPB
SXC
SXC
KWB
KWB
KWB
KWB
JaA
JaA
JaA
JaA
JaA
JaA
JaA
JaA
JaA
JaA
JaA
JaA
JaA
JaA
w
w
KJB
1004
1004

JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 107

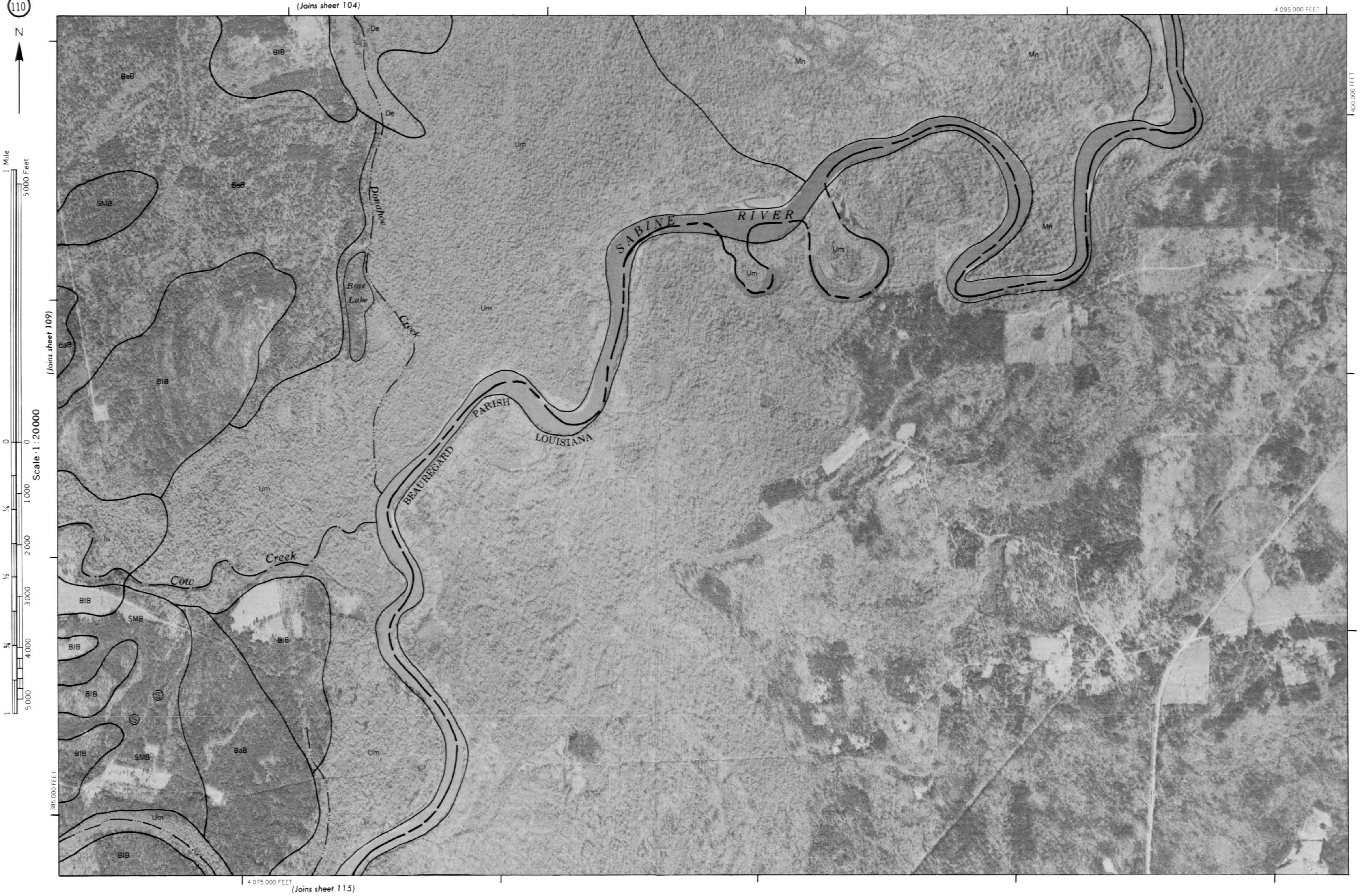


JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 108

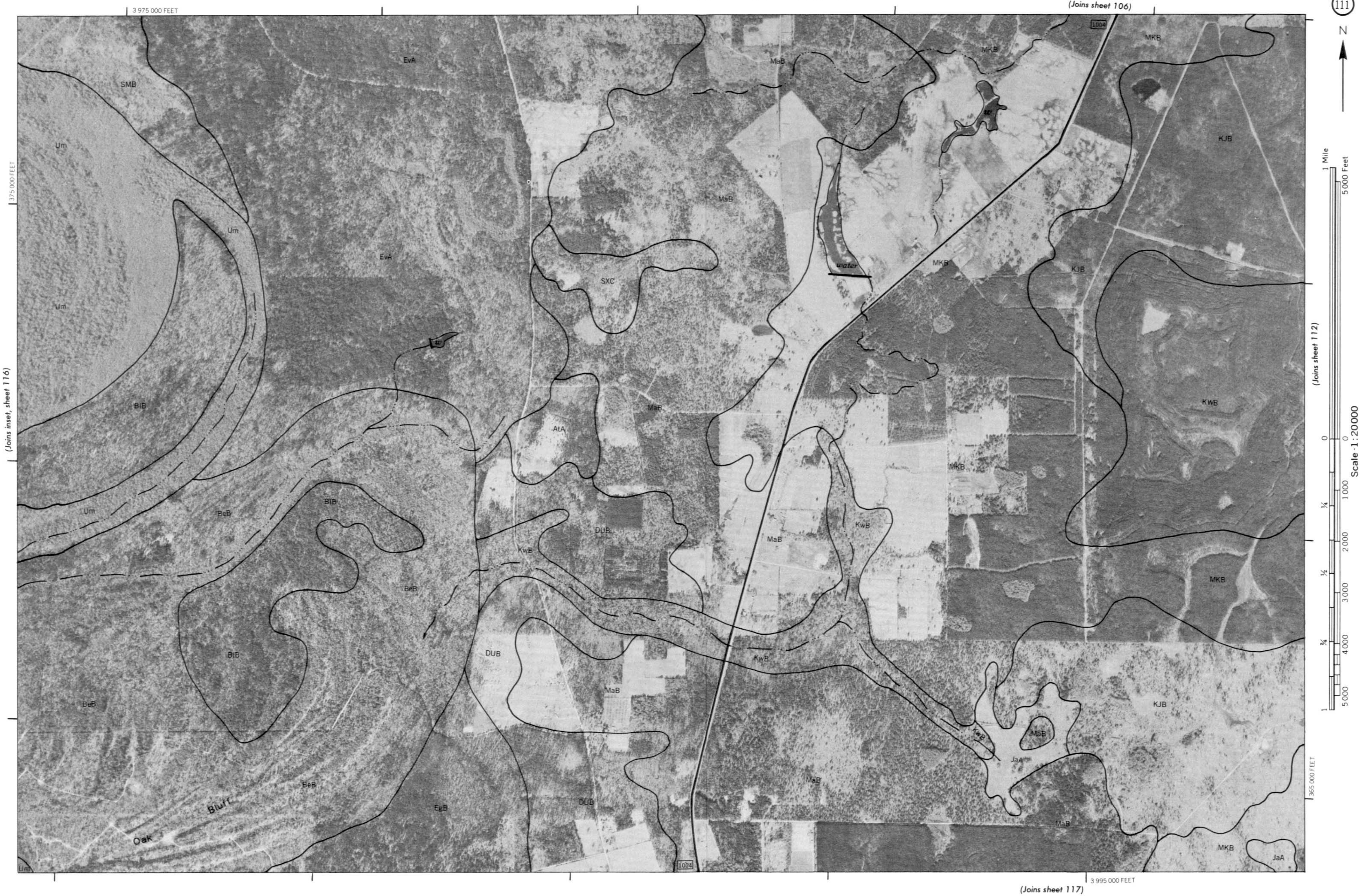



109
N
4 050 000 FEET
(Joins sheet 103)
(Joins sheet 108)
(Joins sheet 110)
(Joins sheet 114)
395 000 FEET
385 000 FEET
4 070 000 FEET
1 Mile
5 000 Feet
Scale 1:20000
0
¼
½
¾
1
1000
2000
3000
4000
5000
87
2829
Slaydons
Creek
Slough
Gum
Cow
Mn
Camp Olanyo
Camp Bill Stark
water
w
EaA
KWB
MaB
EgB
BlB
BaB
BeB
SMB
lu
EvA
Um
S

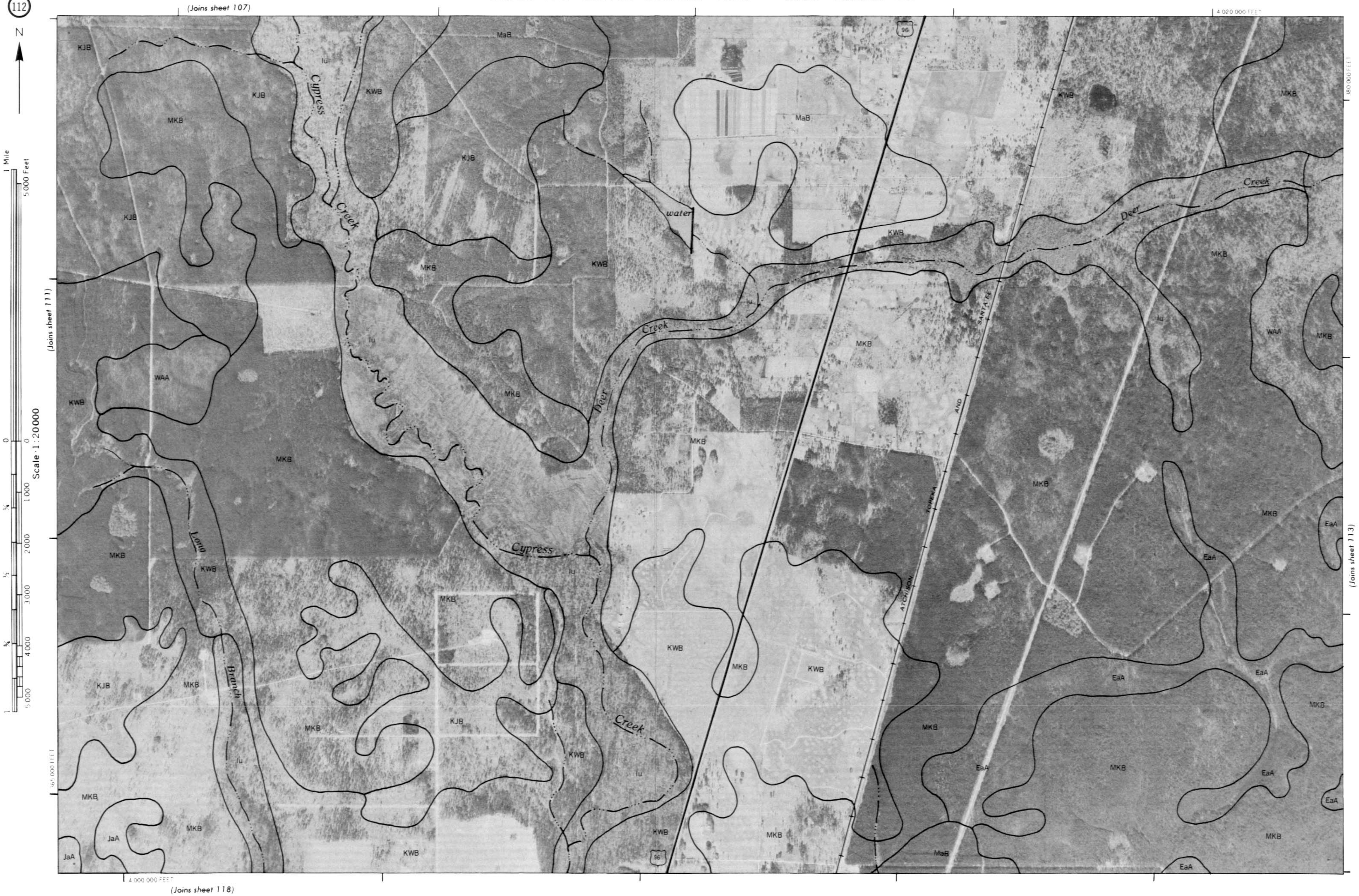
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 110

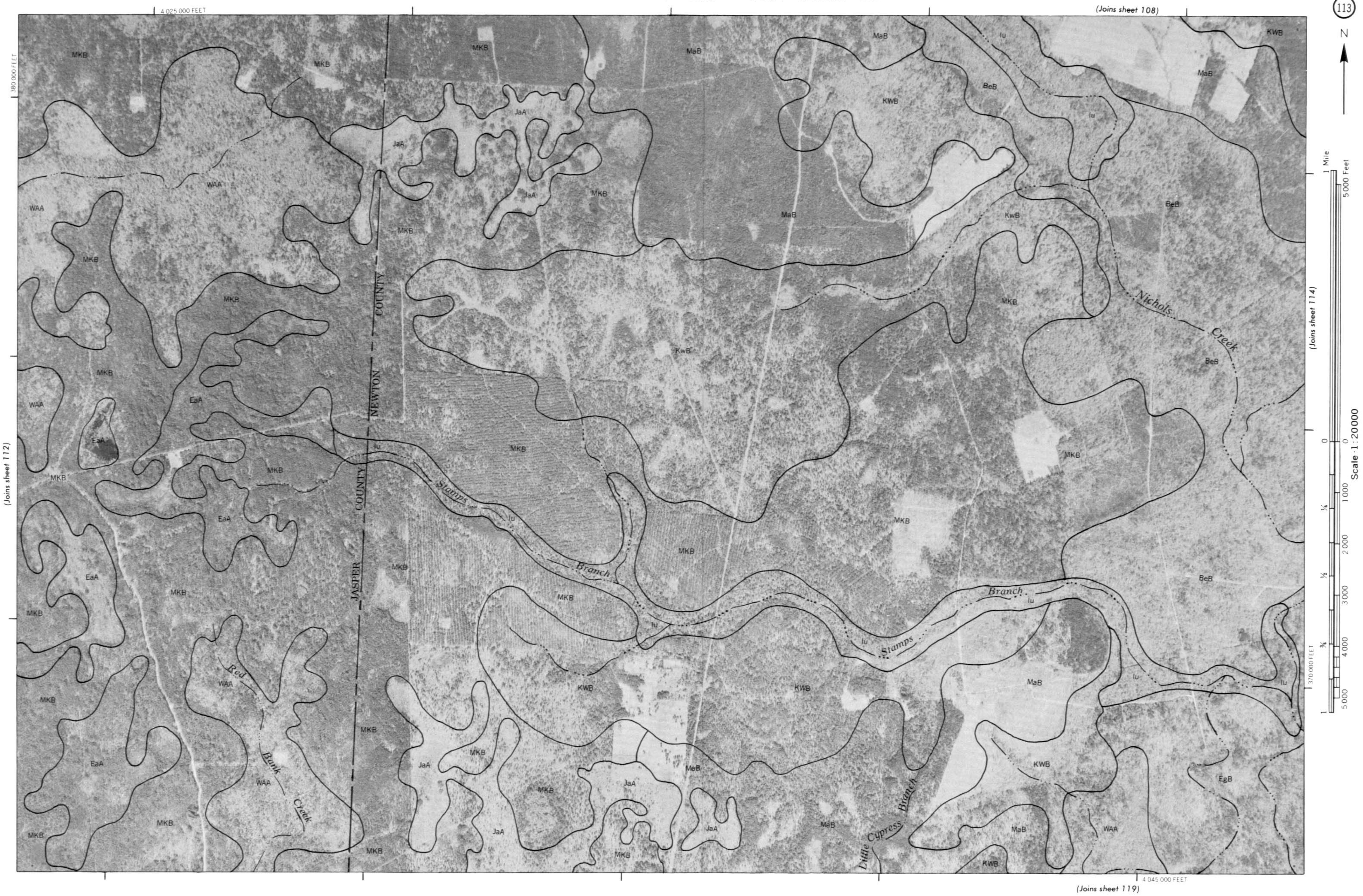


JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 111

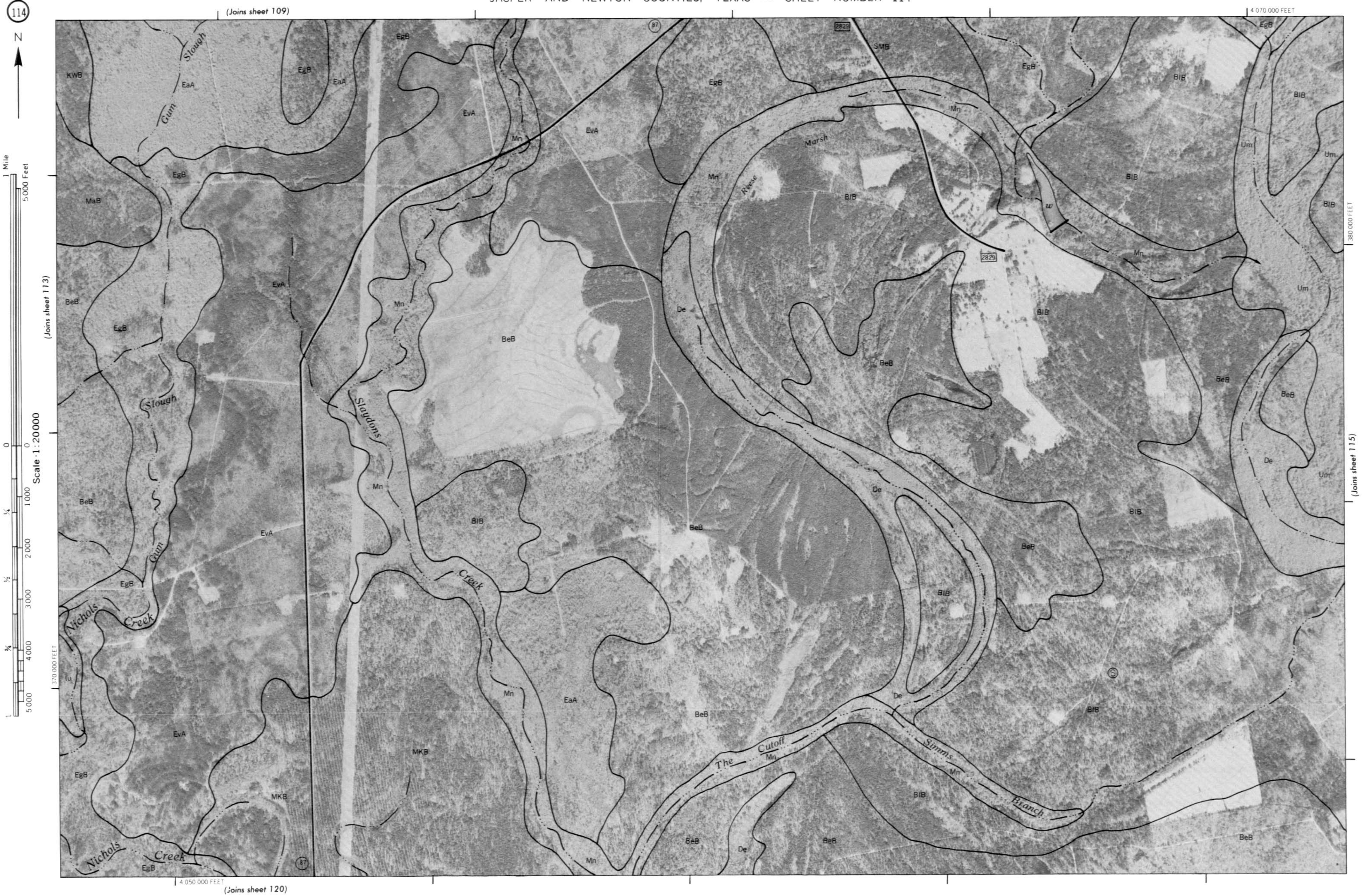


JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 112

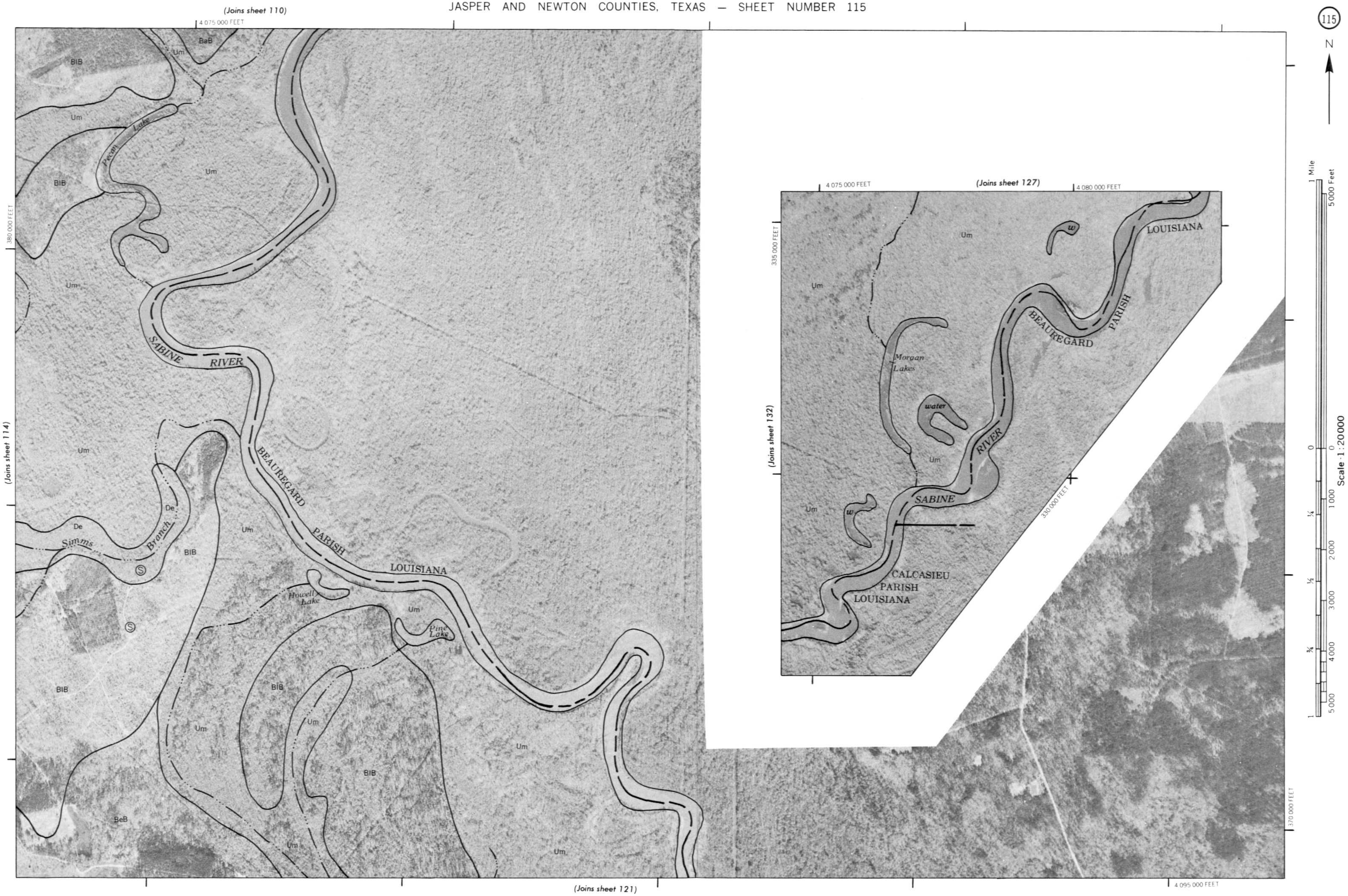


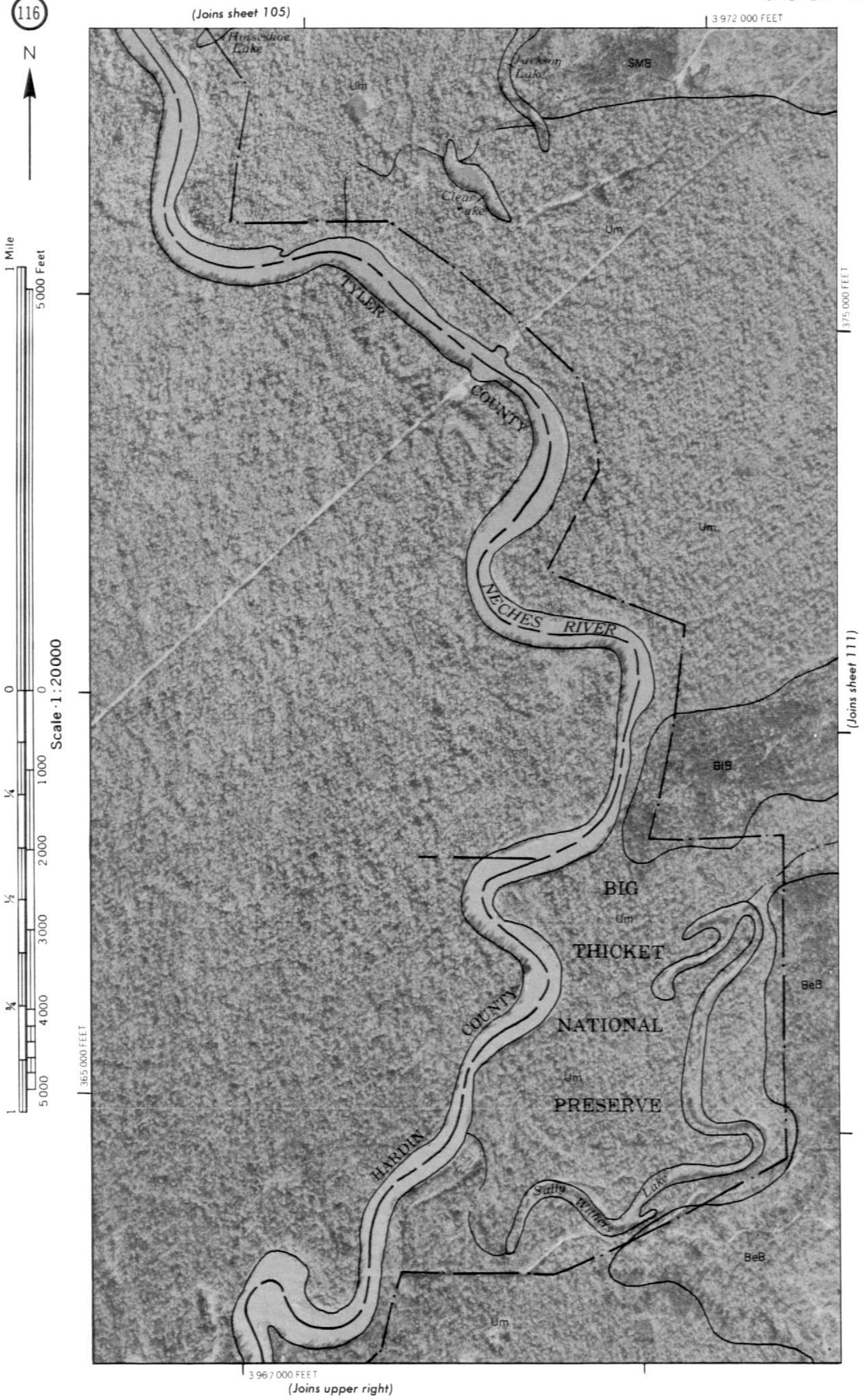

113
N
4 025 000 FEET
(Joins sheet 108)
380 000 FEET
(Joins sheet 112)
(Joins sheet 114)
370 000 FEET
4 045 000 FEET
(Joins sheet 119)
1 Mile
5000 Feet
Scale 1:20000
0
¼
½
¾
1
0
1000
2000
3000
4000
5000
JASPER COUNTY
NEWTON COUNTY
Nichols Creek
Stamps Branch
Red Bank Creek
Little Cypress Branch
MKB
MaB
KWB
KwB
BeB
Iu
JaA
WAA
EaA
EgB

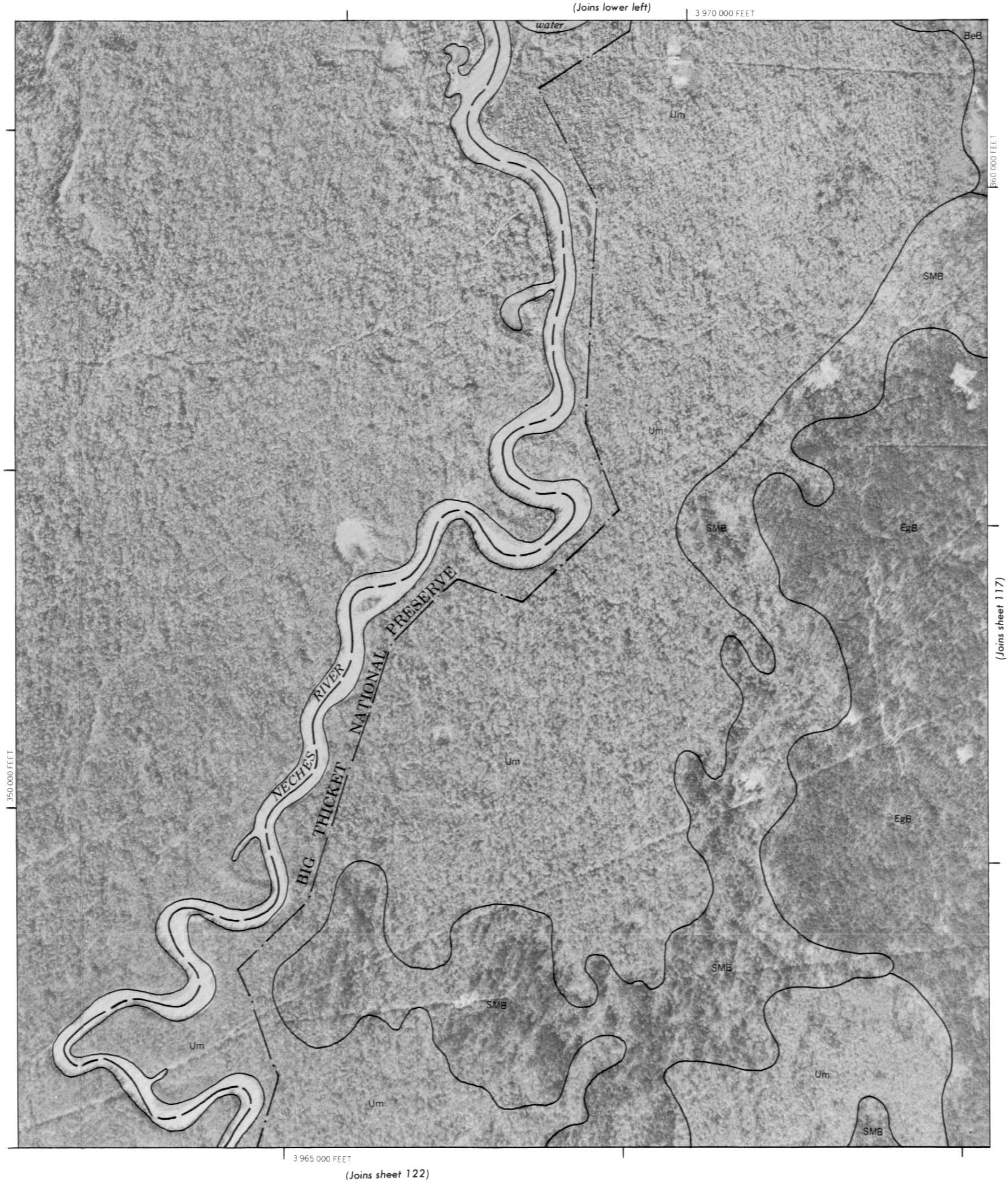
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 114

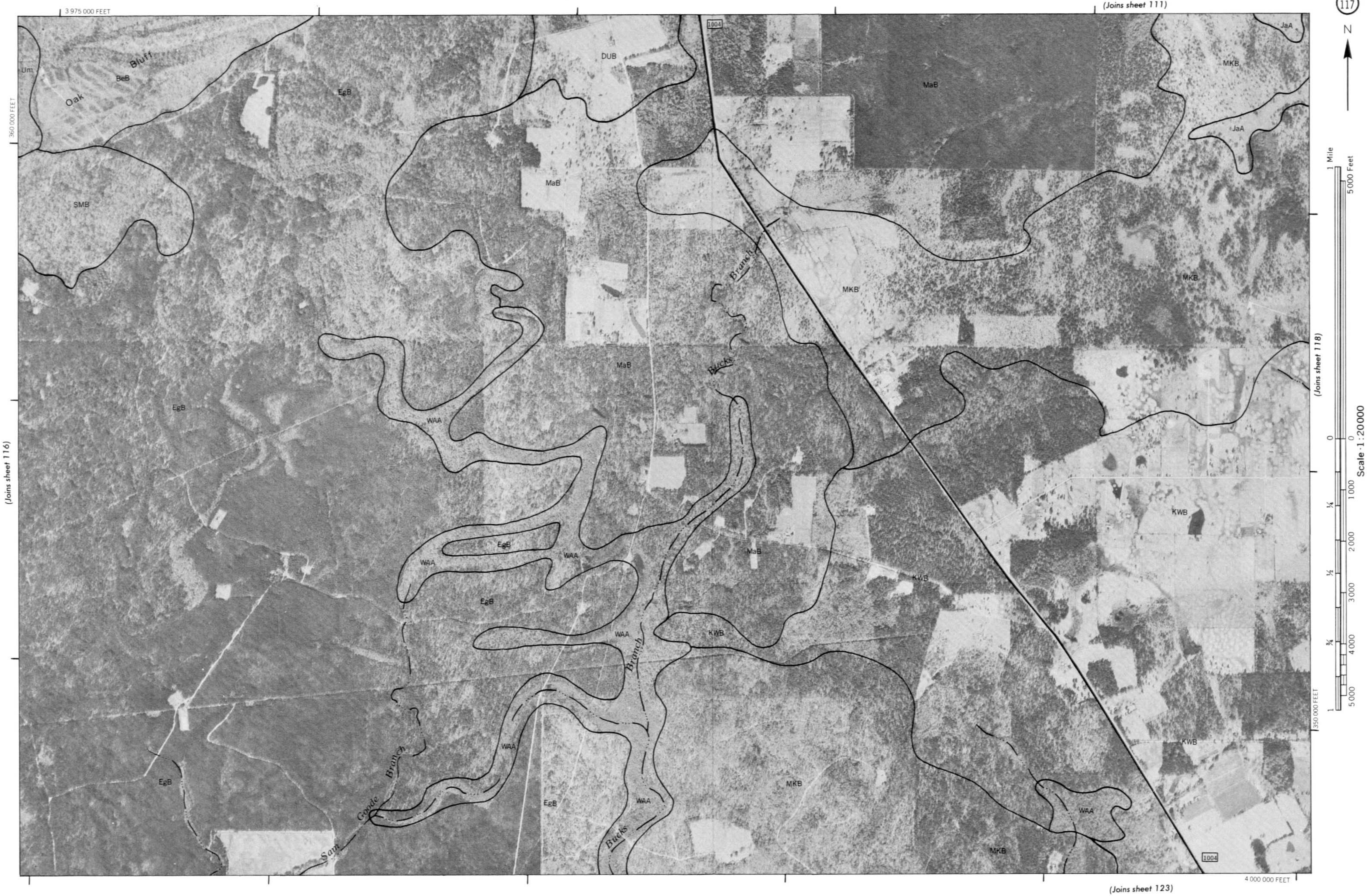


JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 115



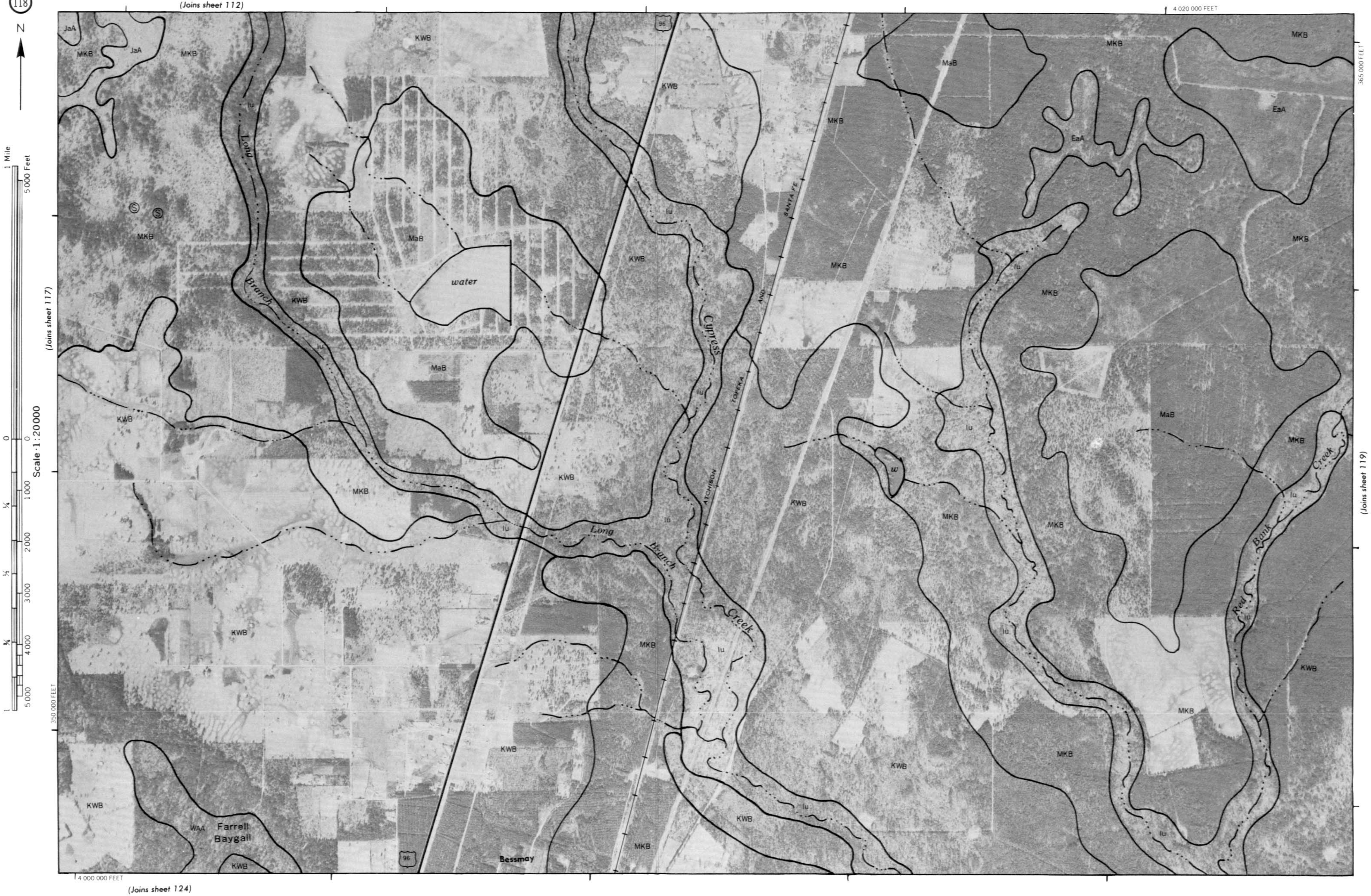

N
(Joins sheet 105)
3 972 000 FEET
375 000 FEET
(Joins sheet 111)
365 000 FEET
3 967 000 FEET
(Joins upper right)
Scale 1:20000
1 Mile
5 000 Feet
0
¼
½
¾
1
1000
2000
3000
4000
5000
Honeycomb Lake
Jackson Lake
Clear Lake
SMB
Um
TYLER
COUNTY
NECHES RIVER
BiB
BIG
THICKET
NATIONAL
PRESERVE
HARDIN
COUNTY
BeB
Sally Withers Lake

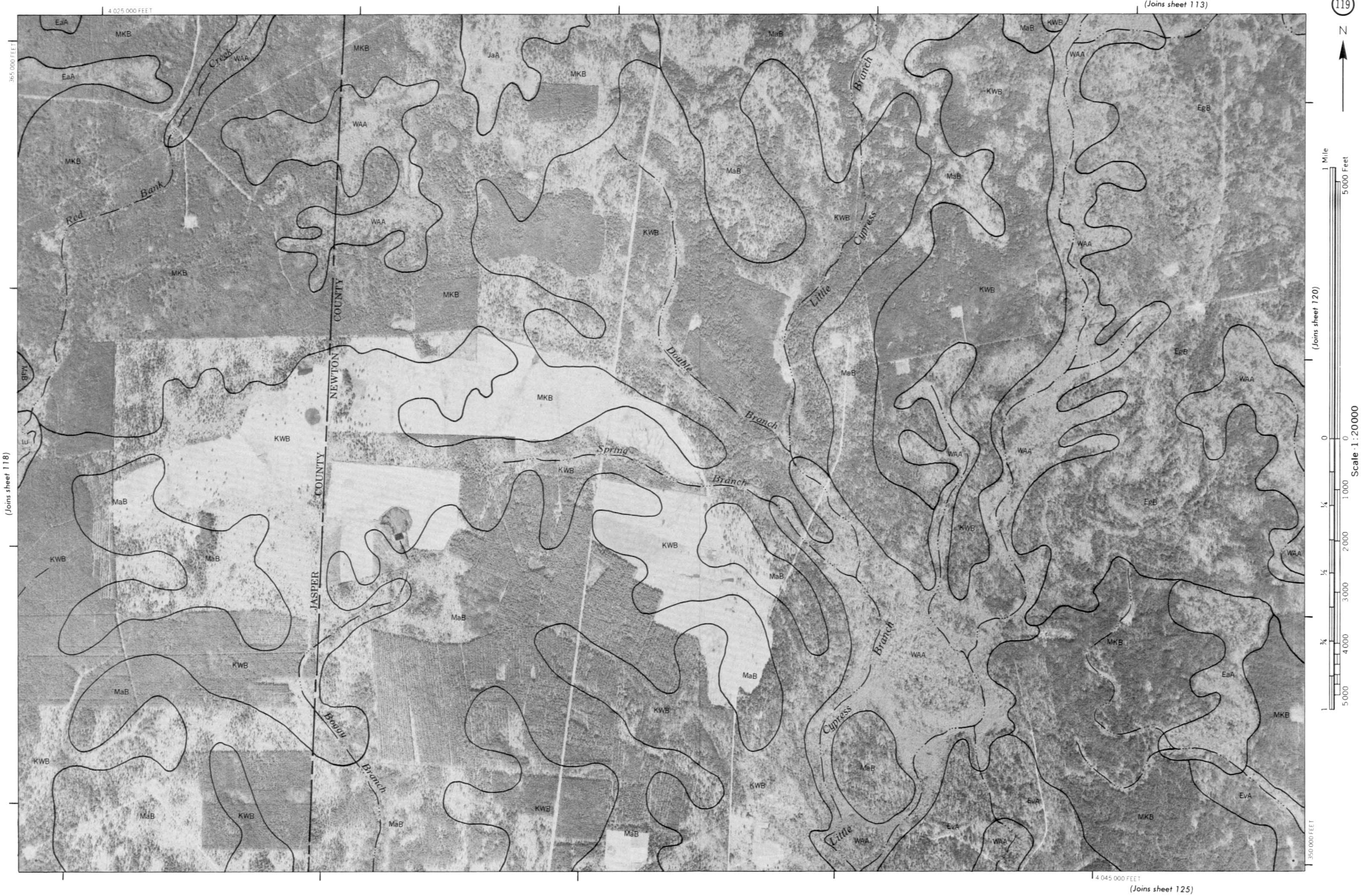

(Joins lower left)
3 970 000 FEET
water
BeB
Um
360 000 FEET
SMB
EgB
(Joins sheet 117)
NECHES RIVER
BIG THICKET NATIONAL PRESERVE
350 000 FEET
3 965 000 FEET
(Joins sheet 122)


117
N
3 975 000 FEET
(Joins sheet 111)
1004
Um
Oak
Bluff
BeB
EgB
DUB
MaB
MKB
JaA
JaA
360 000 FEET
SMB
MaB
Branch
MKB
MKB
MaB
Bucks
(Joins sheet 118)
(Joins sheet 116)
EgB
WAA
KWB
EgB
WAA
WAA
MaB
KWB
EgB
WAA
KWB
Branch
WAA
KWB
Goode
Branch
EgB
MKB
EgB
WAA
WAA
Sam
Bucks
MKB
350 000 FEET
1004
4 000 000 FEET
(Joins sheet 123)
1 Mile
5 000 Feet
0
¼
½
¾
1
0
1000
2000
3000
4000
5000
Scale 1:20000

(118)

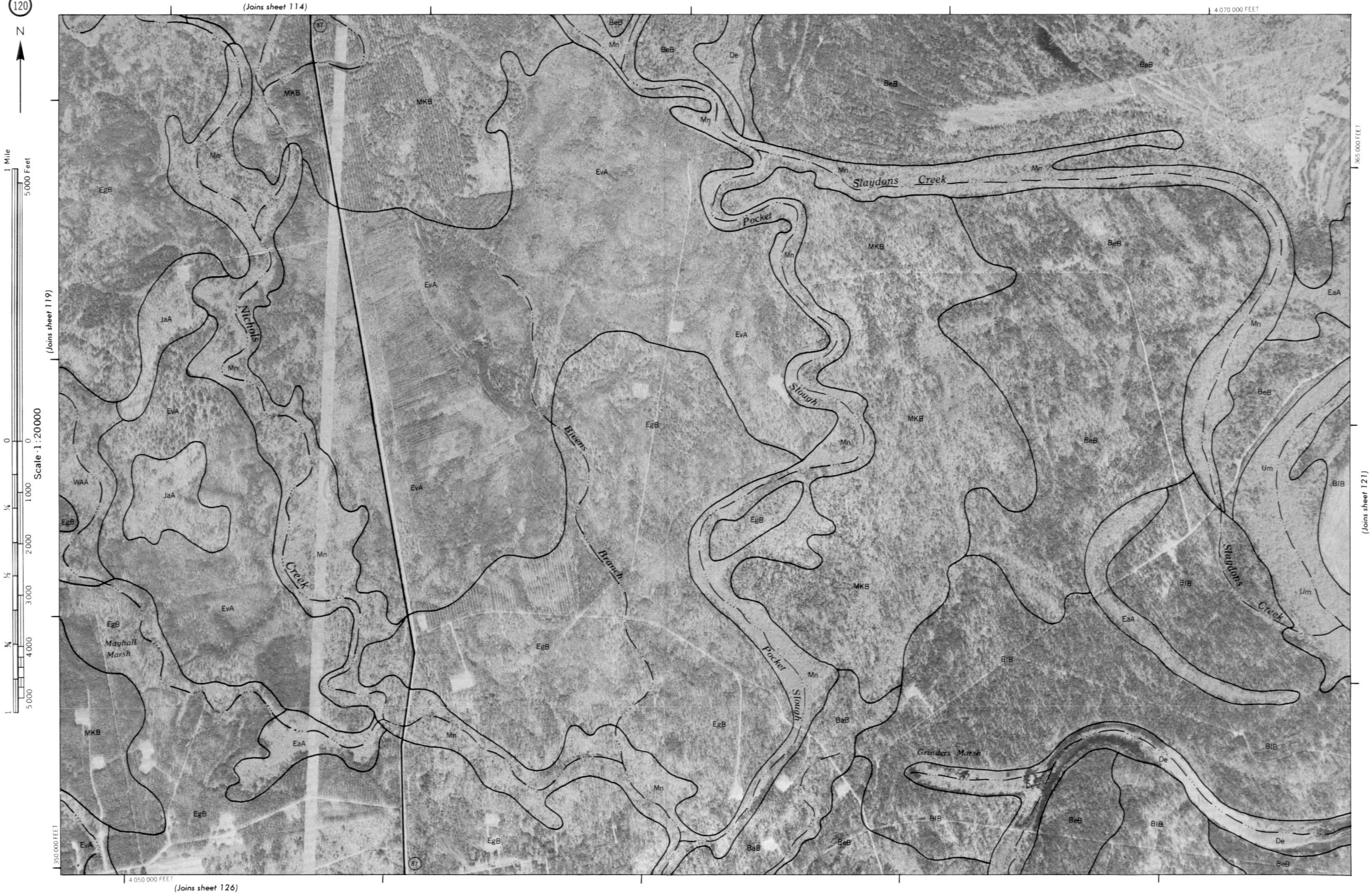
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 118




4 025 000 FEET
(Joins sheet 113)
N
365 000 FEET
EaA
MKB
Creek
WAA
EaA
MKB
JaA
MKB
MaB
MaB
KWB
Branch
WAA
KWB
EpB
MKB
WAA
Red
Bank
WAA
MaB
MaB
KWB
Cypress
WAA
KWB
MKB
NEWTON
COUNTY
MKB
Little
KWB
Double
MaB
EpB
WAA
1 Mile
5000 Feet
(Joins sheet 120)
MaB
MKB
Branch
WAA
WAA
KWB
Spring
KWB
Branch
EpB
(Joins sheet 118)
Eu
MaB
JASPER
COUNTY
KWB
KWB
MaB
MaB
WAA
KWB
MaB
Branch
WAA
MKB
KWB
MaB
KWB
Cypress
EaA
MKB
MaB
Boggy
KWB
Branch
KWB
MaB
KWB
KWB
EvA
EvA
MaB
KWB
MaB
MaB
Little
WAA
EvA
WAA
MKB
0
¼
½
¾
1
0
1000
2000
3000
4000
5000
Scale 1:20000
350 000 FEET
4 045 000 FEET
(Joins sheet 125)

120

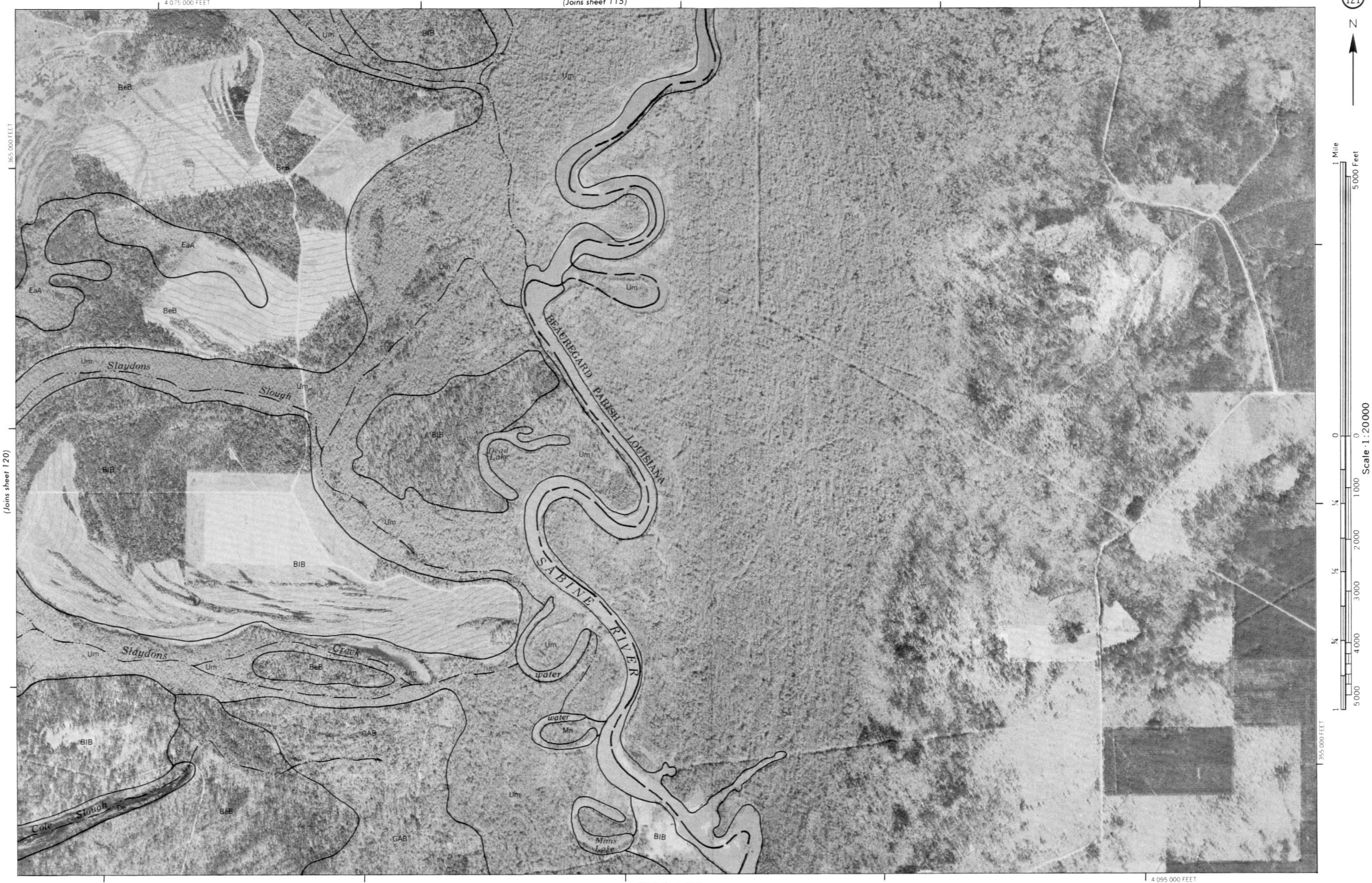
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 120



JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 121

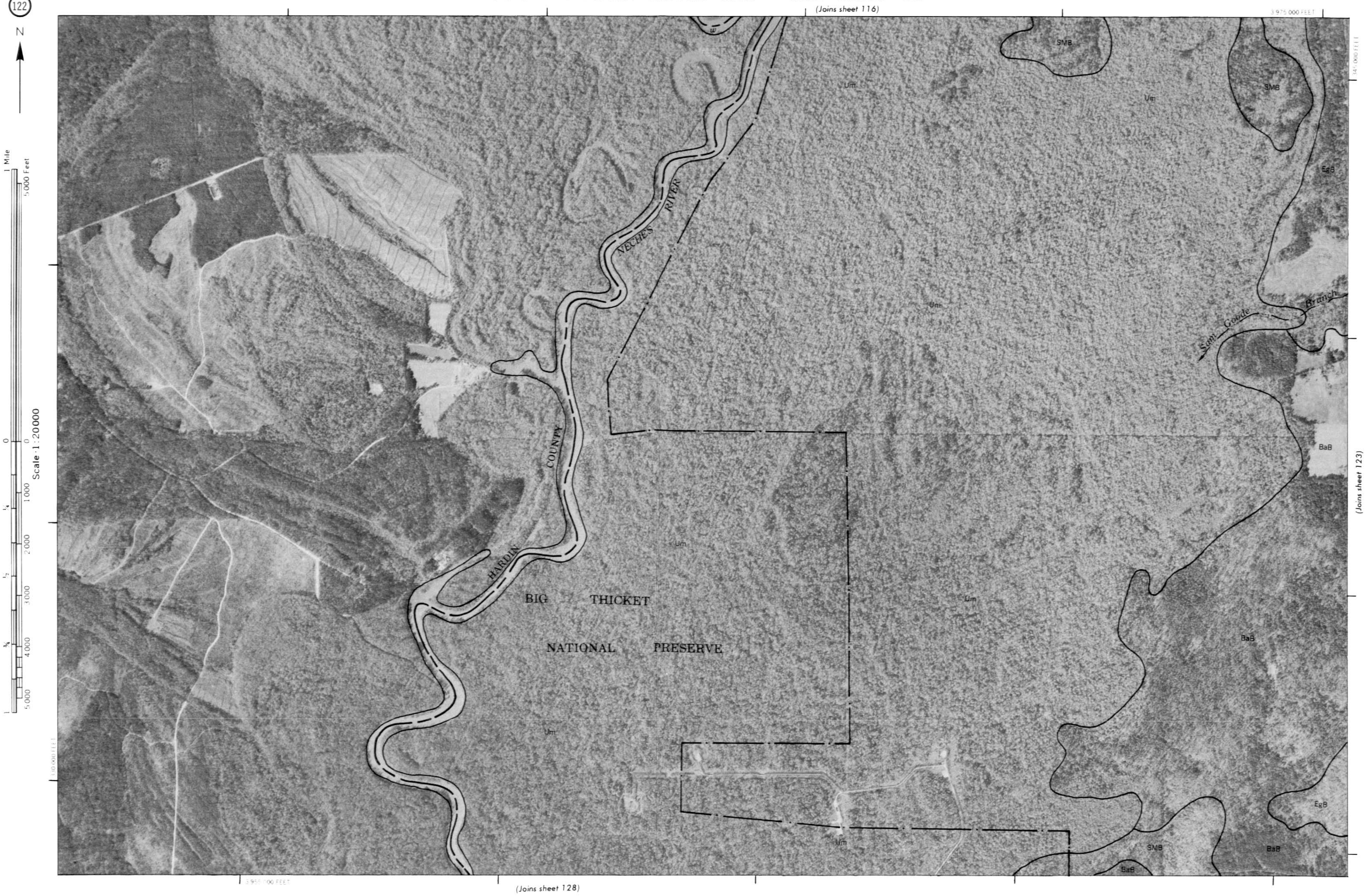
(Joins sheet 115)

(Joins sheet 120)

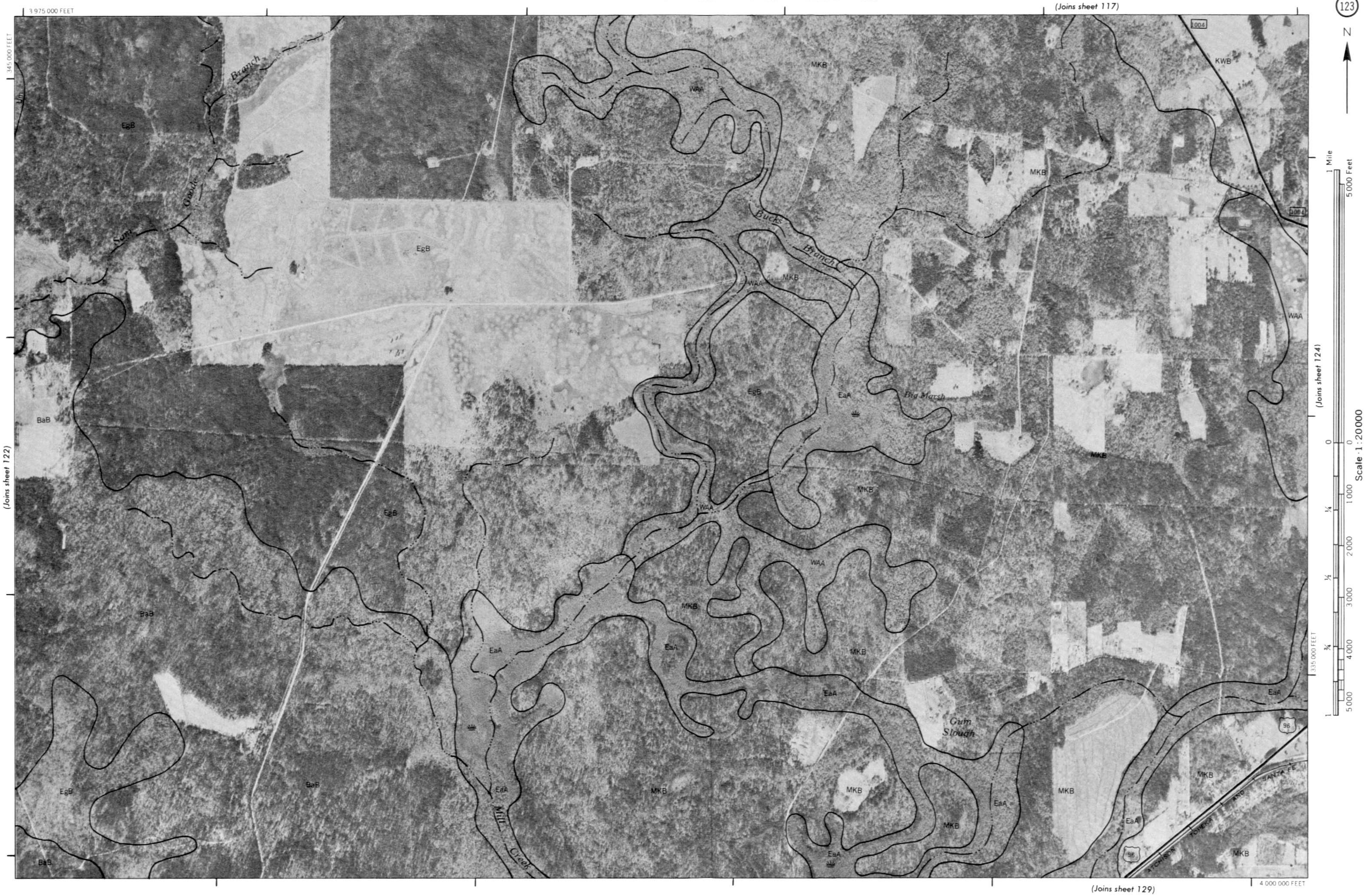


(Joins sheet 127)

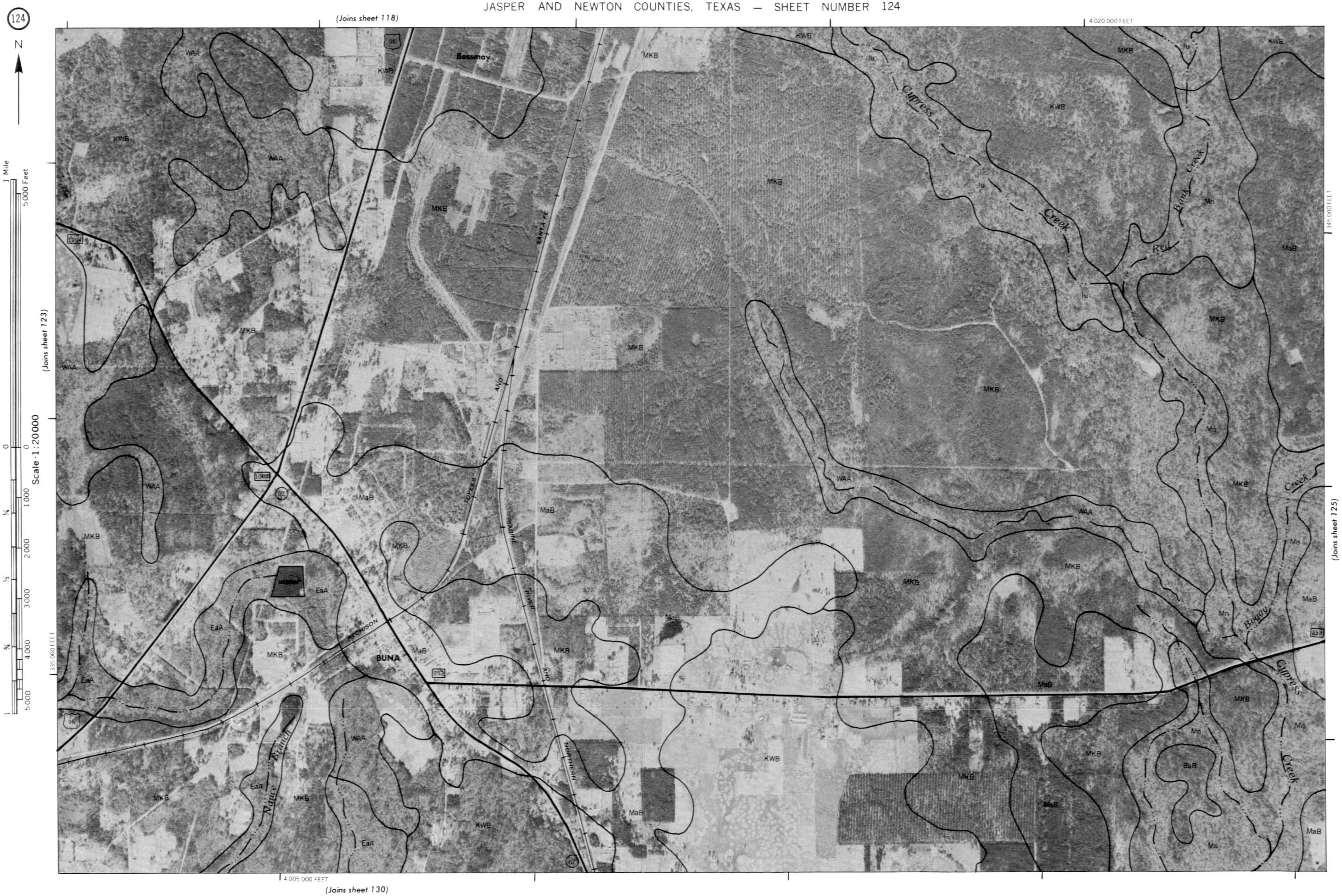
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 122



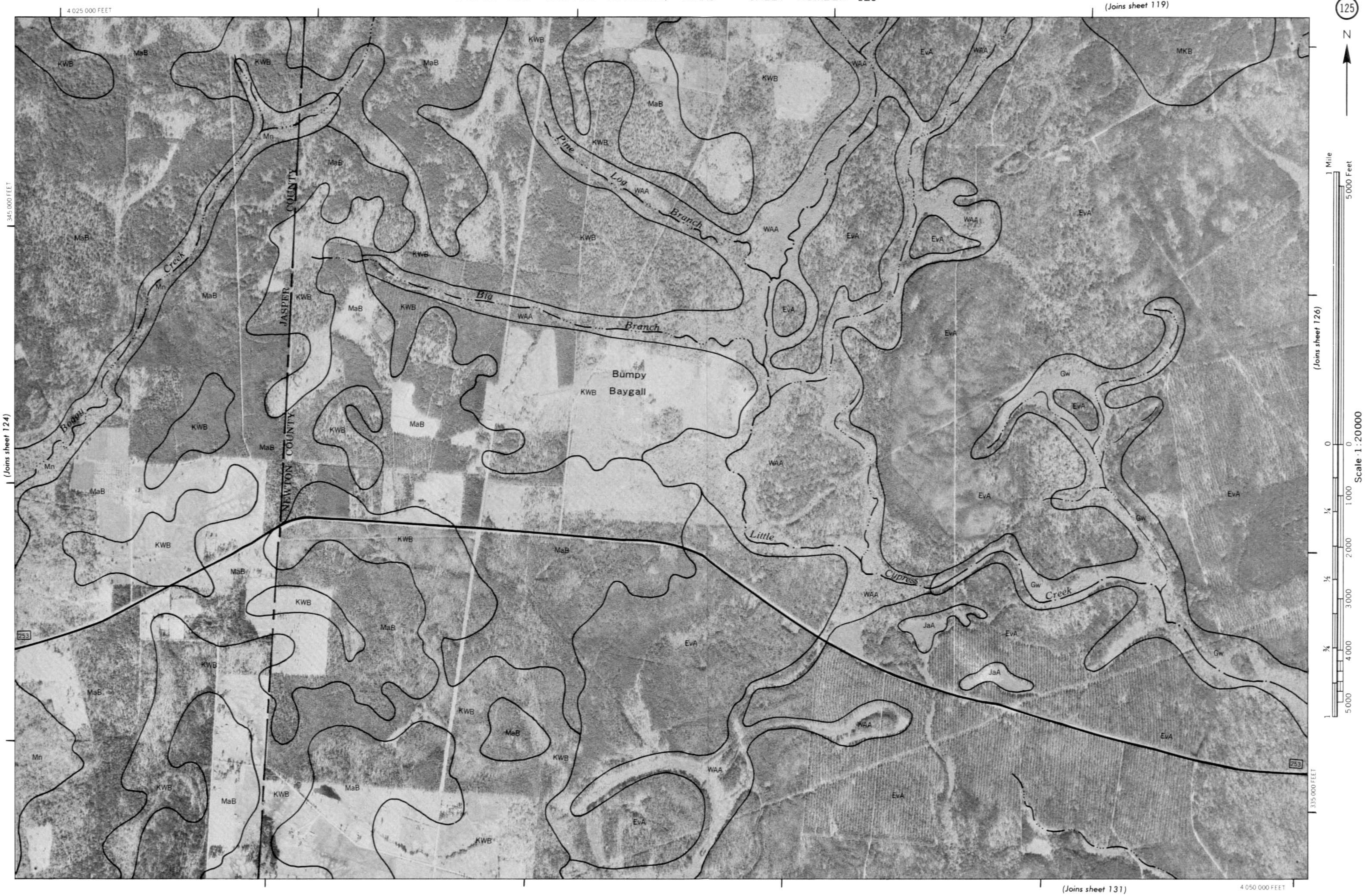
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 123



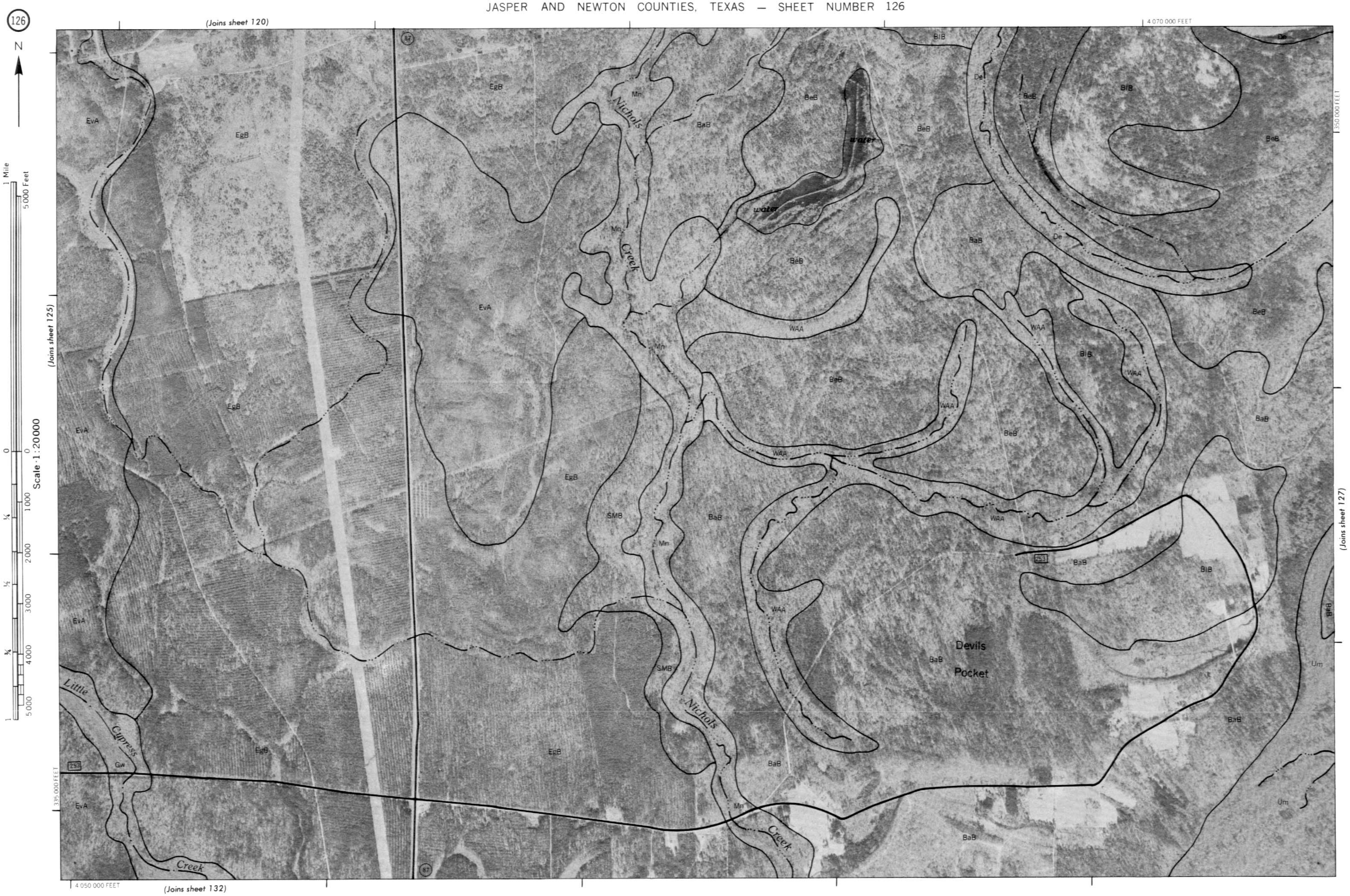
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 124

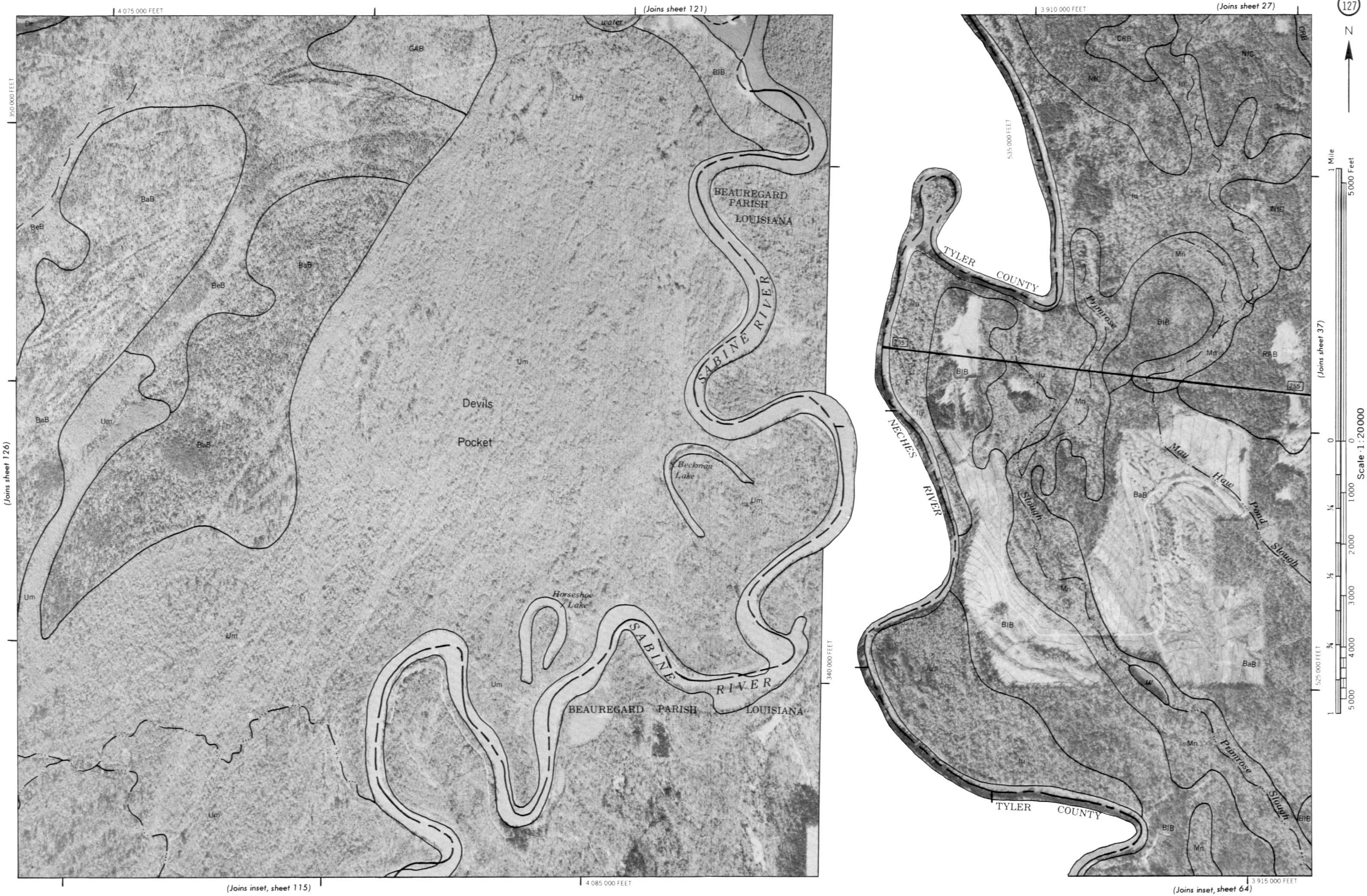


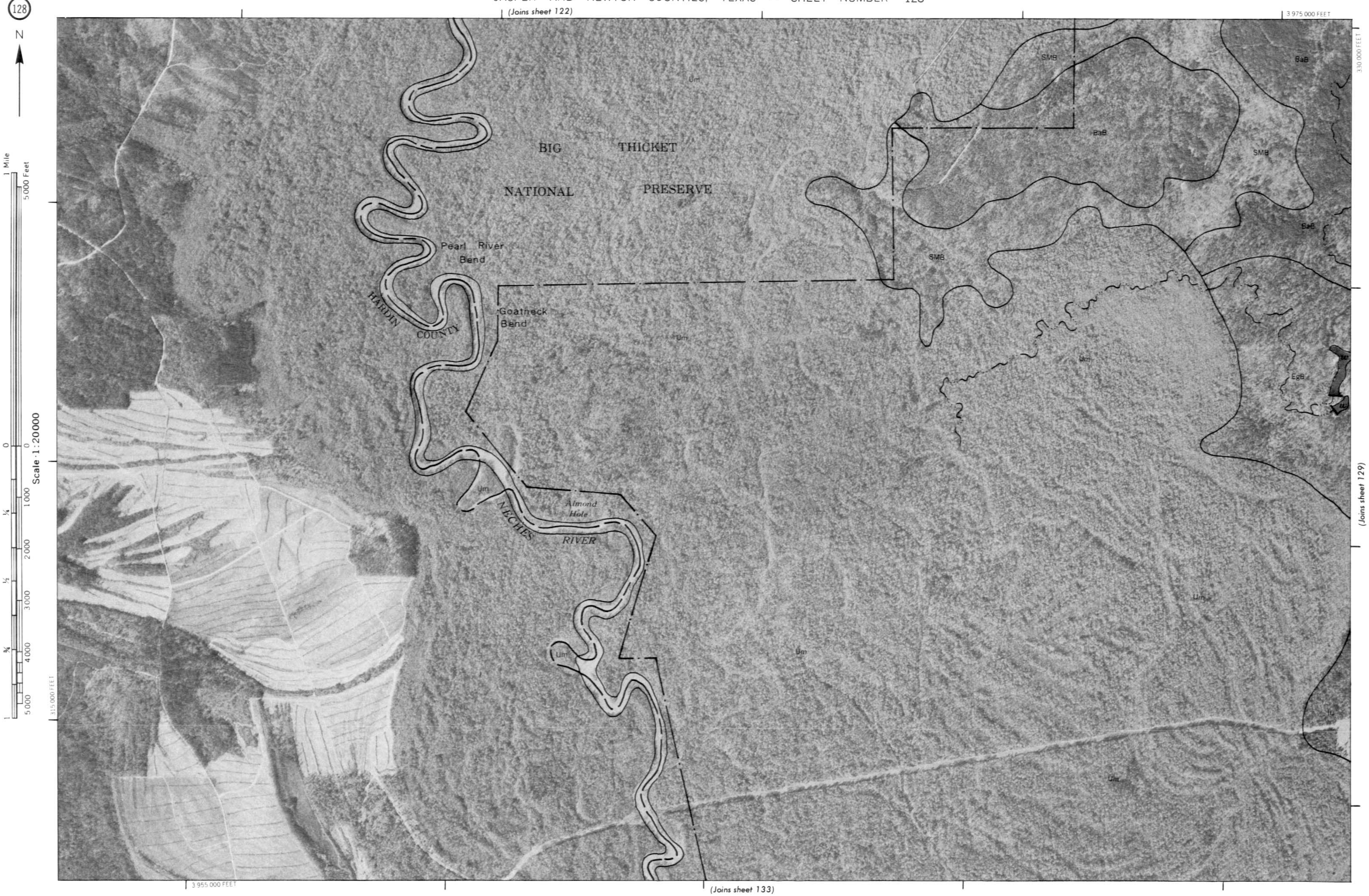
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 125

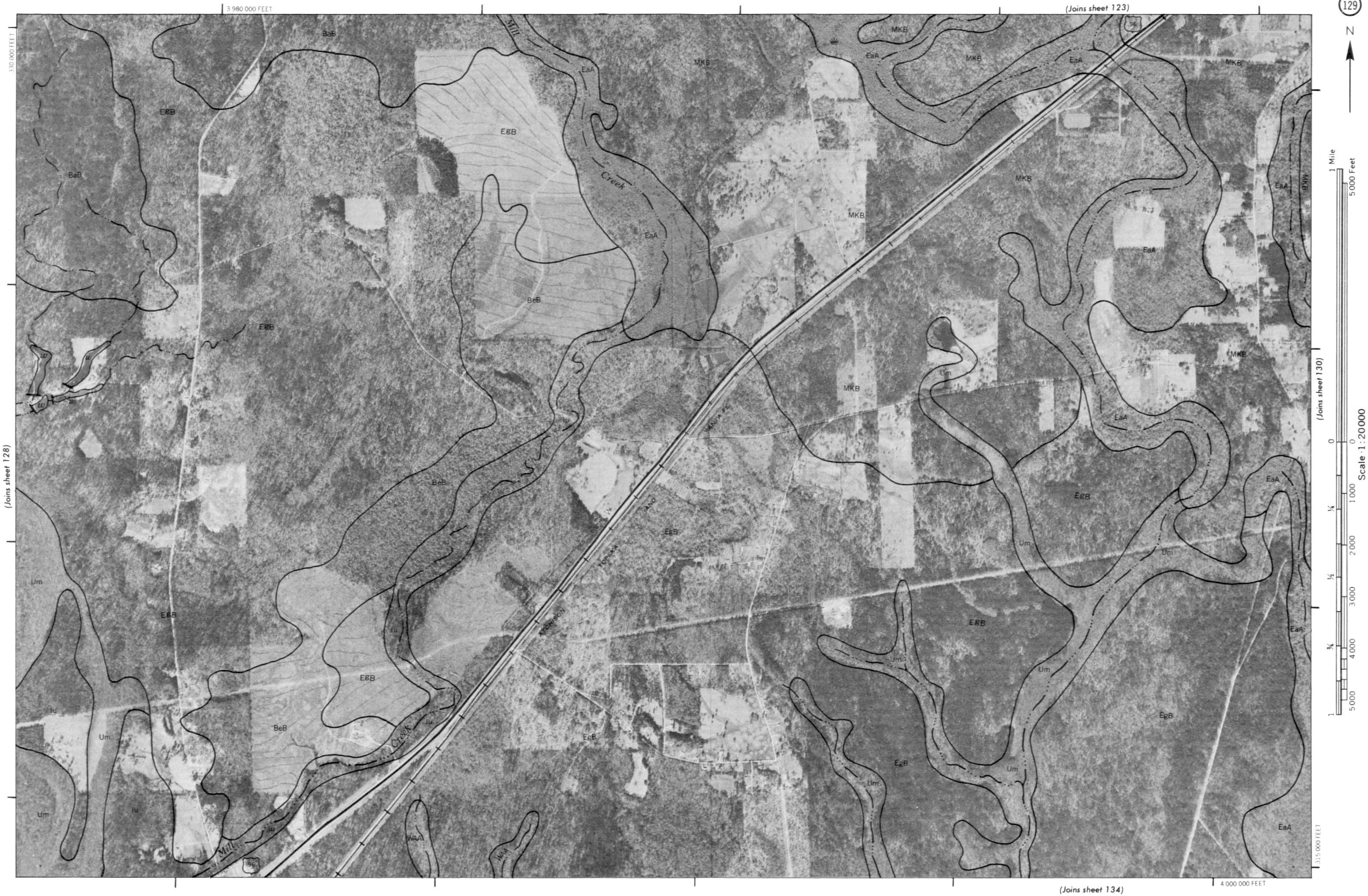


JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 126

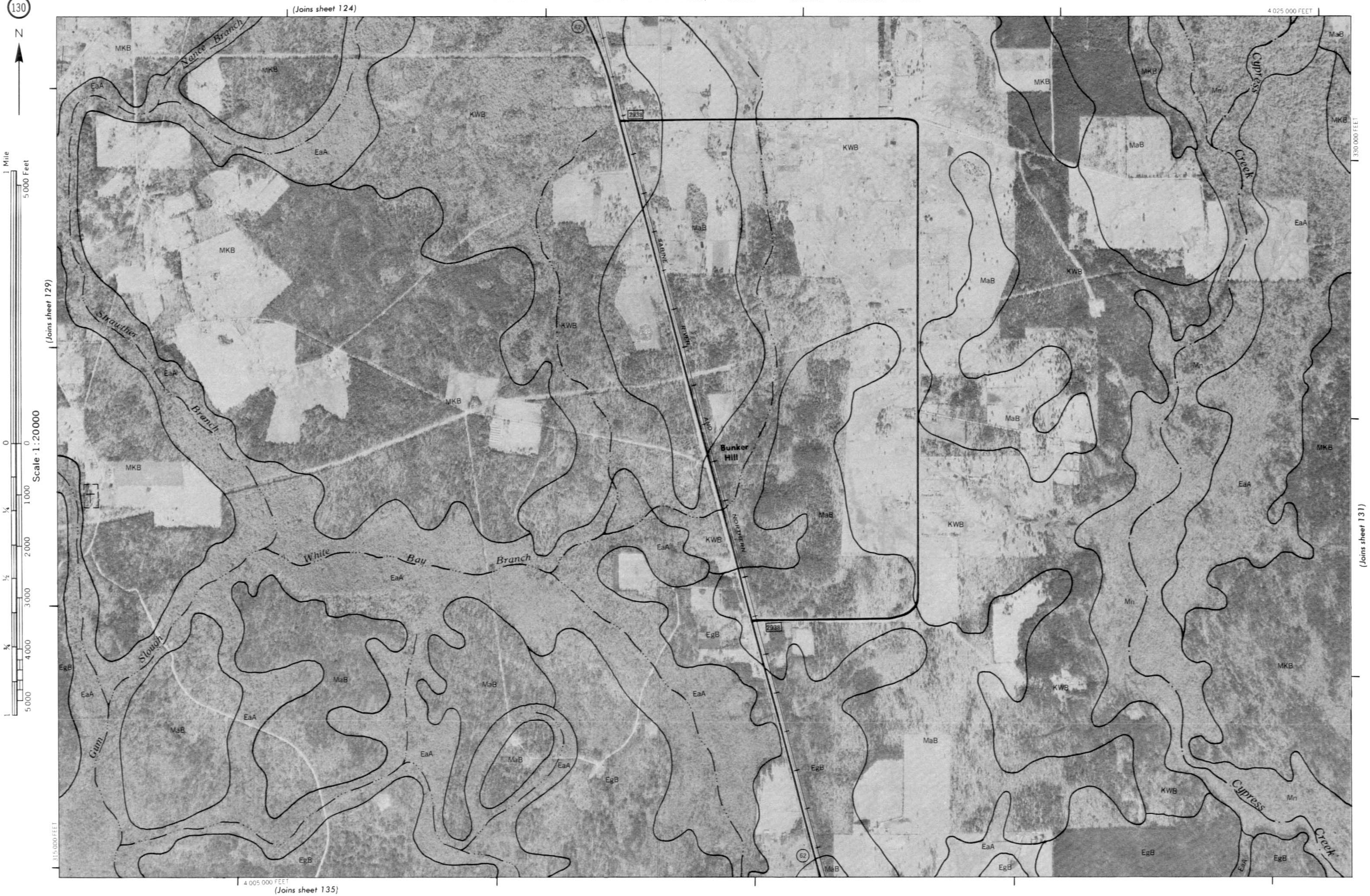


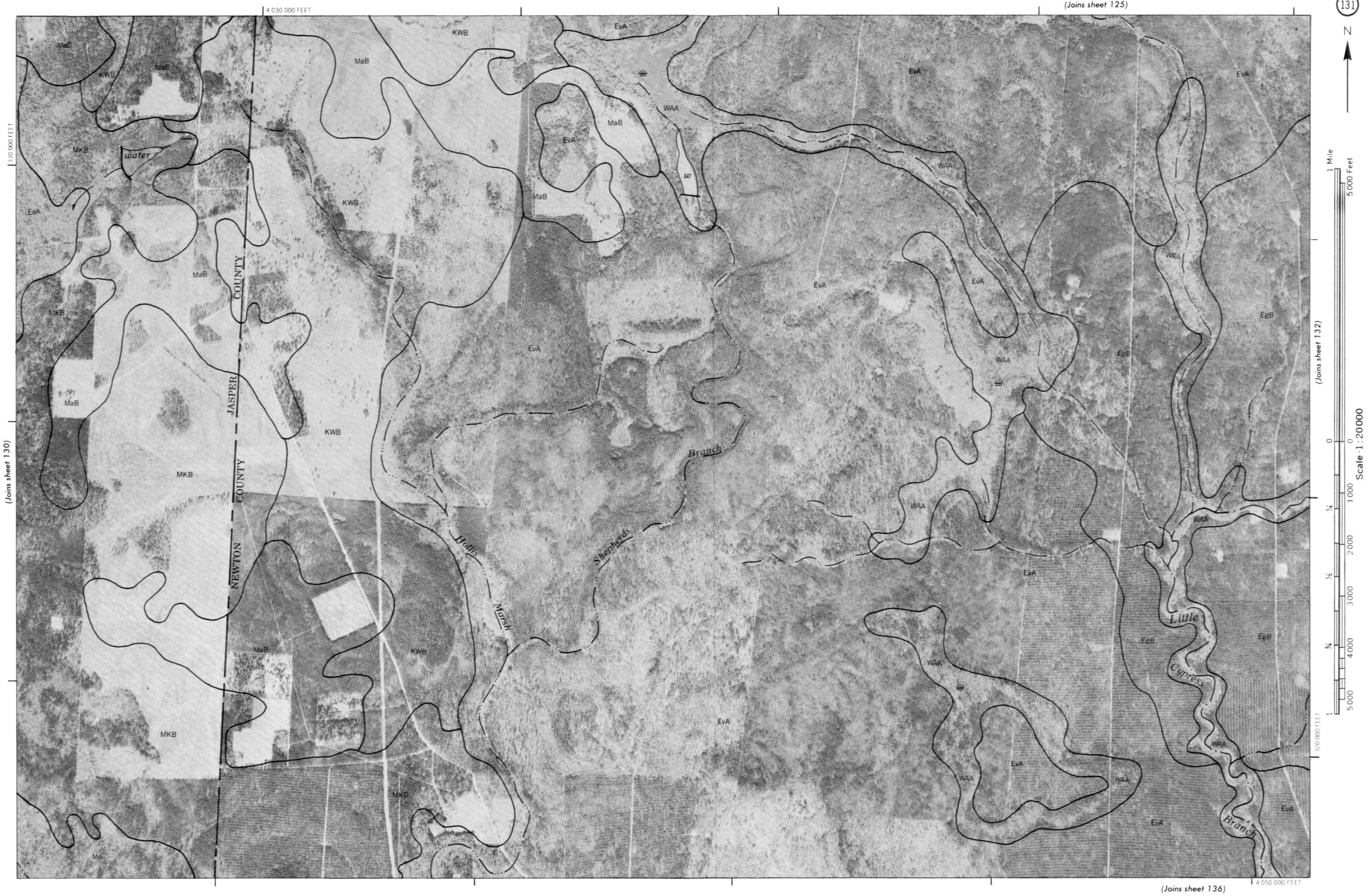

127
4 075 000 FEET
(Joins sheet 121)
350 000 FEET
(Joins sheet 126)
(Joins inset, sheet 115)
4 085 000 FEET
340 000 FEET
De
water
GAB
BIB
Um
BaB
BeB
BeB
BaB
BaB
BaB
BaB
Um
BEAUREGARD
PARISH
LOUISIANA
SABINE RIVER
Devils
Pocket
Beckman
Lake
Horseshoe
Lake
SABINE
RIVER
BEAUREGARD PARISH
LOUISIANA
3 910 000 FEET
(Joins sheet 27)
535 000 FEET
CRB
NtC
NtC
Iu
Iu
NtC
Mn
TYLER
COUNTY
Primrose
BIB
255
Mn
RAB
255
BIB
Iu
Mn
Iu
NECHES
RIVER
Mau
Haw
Pond
Slough
Slough
BaB
BaB
Mn
BIB
Iu
W
Iu
Mn
Primrose
Slough
TYLER
COUNTY
BIB
Mn
BIB
525 000 FEET
(Joins sheet 37)
(Joins inset, sheet 64)
3 915 000 FEET
N
1 Mile
5 000 Feet
Scale 1:20000
0
¼
½
¾
1
0
1000
2000
3000
4000
5000

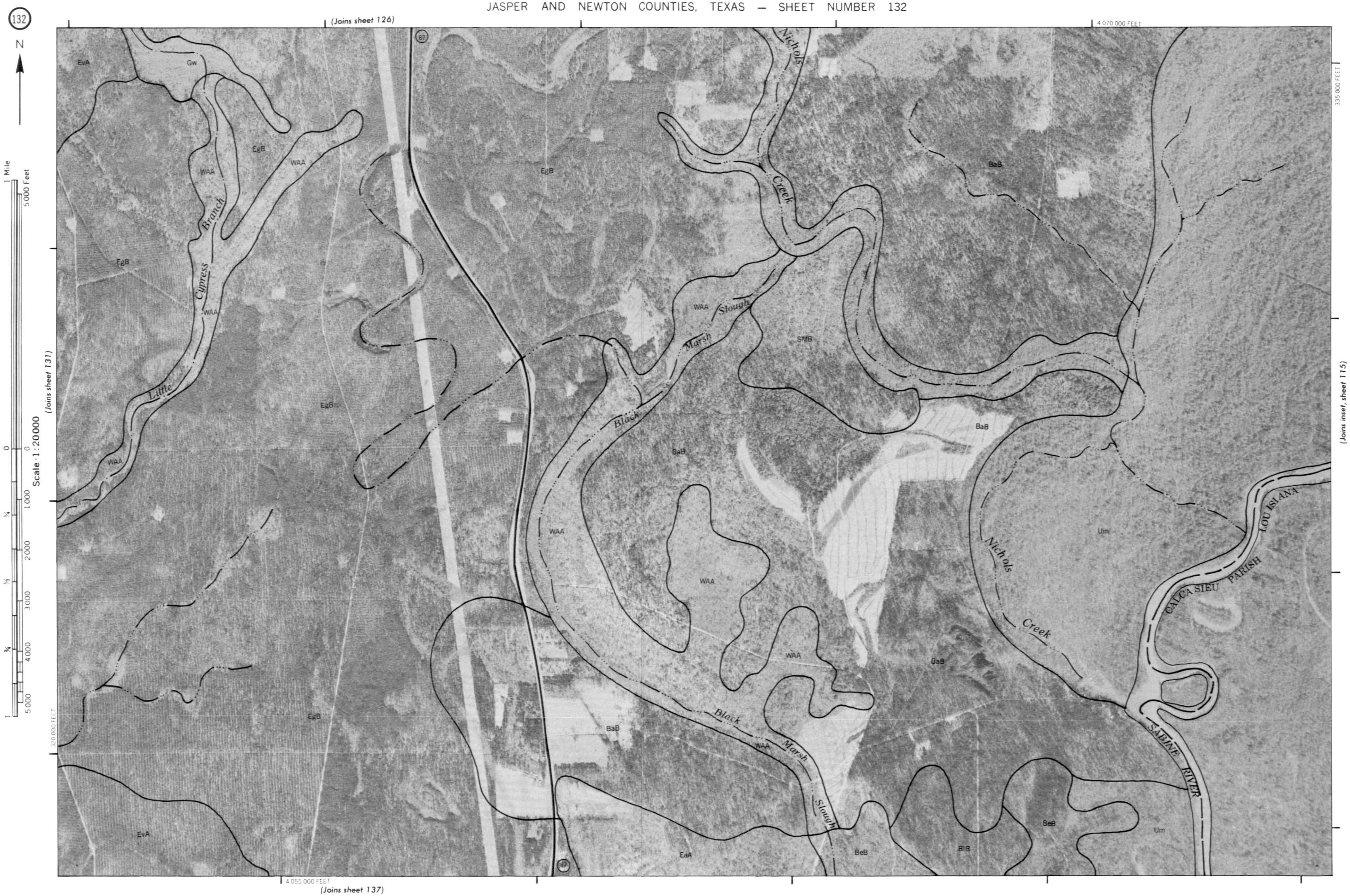

128
N
(Joins sheet 122)
3 975 000 FEET
330 000 FEET
1 Mile
5 000 Feet
Scale 1:20000
0
0
1000
¼
2000
½
3000
¾
4000
5000
1
315 000 FEET
3 955 000 FEET
(Joins sheet 133)
(Joins sheet 129)
BIG THICKET NATIONAL PRESERVE
Pearl River Bend
HARDIN COUNTY
Goatneck Bend
Almond Hole
NECHES RIVER
Um
SMB
BaB
EgB
W
Iu


3 980 000 FEET
330 000 FEET
(Joins sheet 123)
(Joins sheet 128)
(Joins sheet 130)
(Joins sheet 134)
4 000 000 FEET
315 000 FEET
N
1 Mile
5000 Feet
Scale 1:20000
0
1000
2000
3000
4000
5000
¼
½
¾
1
Mill
Creek
BaB
EgB
BeB
EaA
MKB
Um
Iu
WaA
96
ATCHISON
TOPEKA
AND
SANTA FE

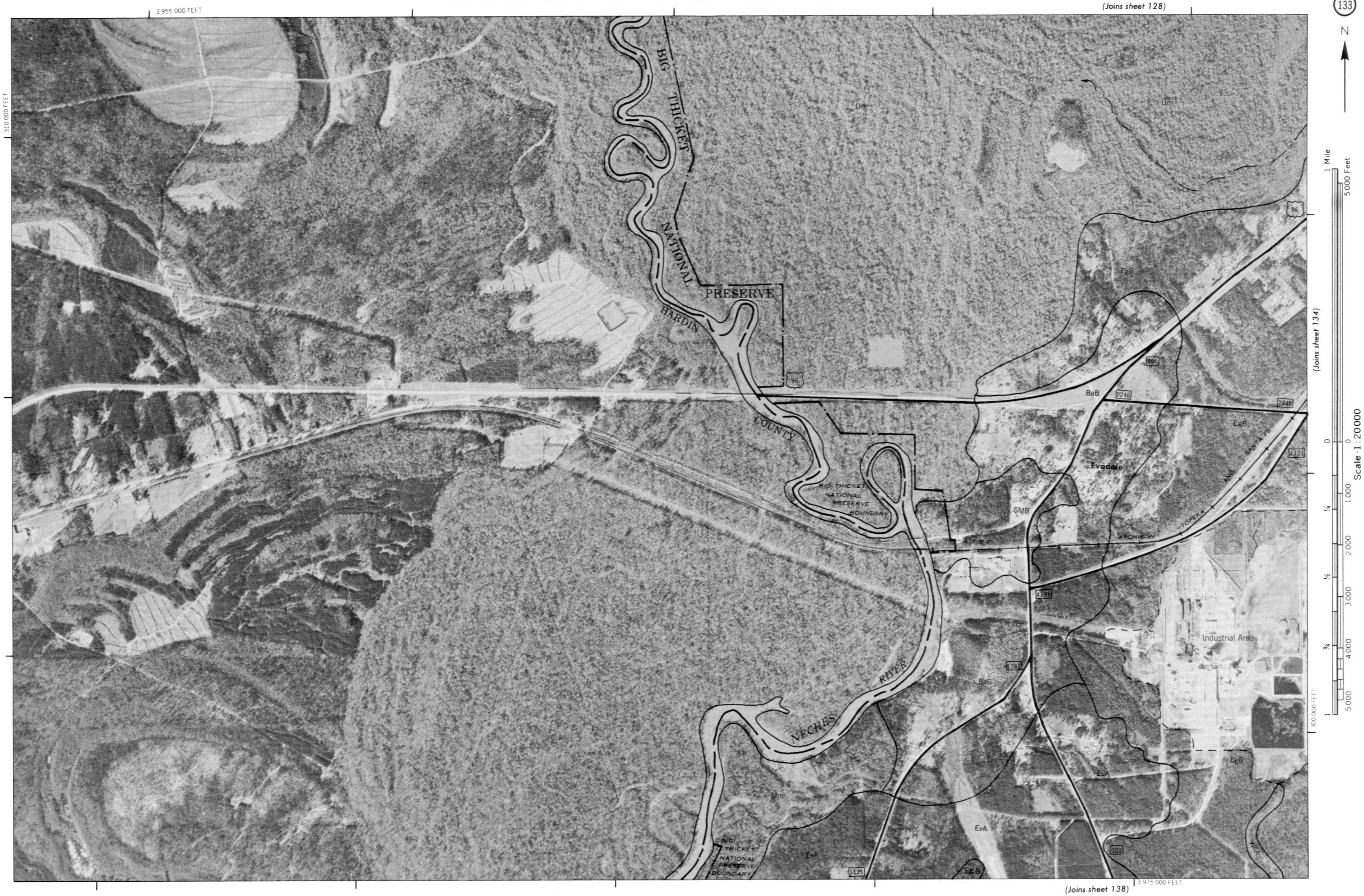
JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 130

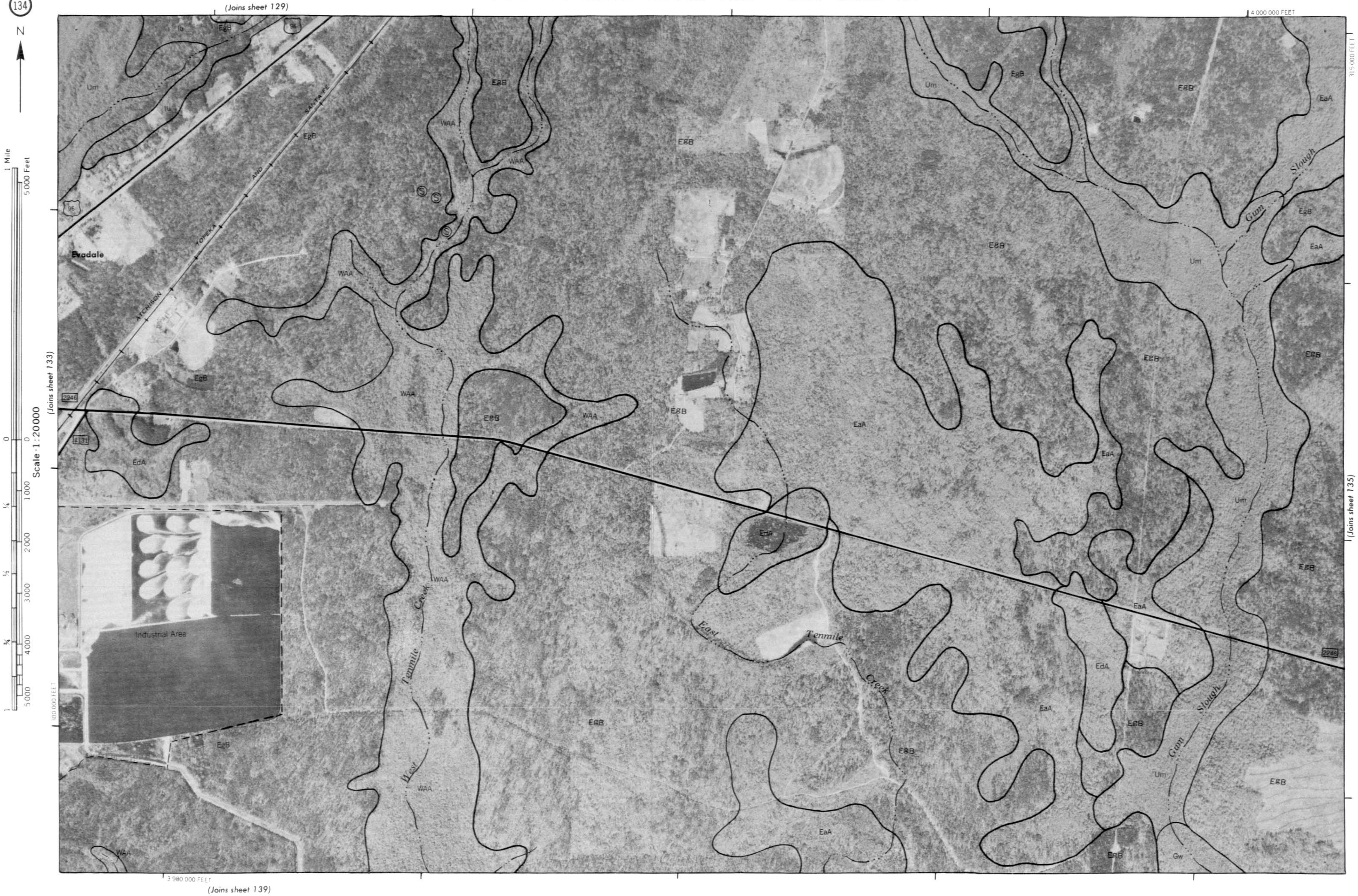



4 030 000 FEET
(Joins sheet 125)
N
330 000 FEET
(Joins sheet 130)
(Joins sheet 132)
(Joins sheet 136)
4 050 000 FEET
320 000 FEET
1 Mile
5000 Feet
Scale 1:20000
0
¼
½
¾
1
0
1000
2000
3000
4000
5000
MaB
KWB
EvA
WAA
MKB
EaA
EgB
Mn
water
w
JASPER COUNTY
NEWTON COUNTY
Hollis Marsh
Shepherds Branch
Little Cypress Branch

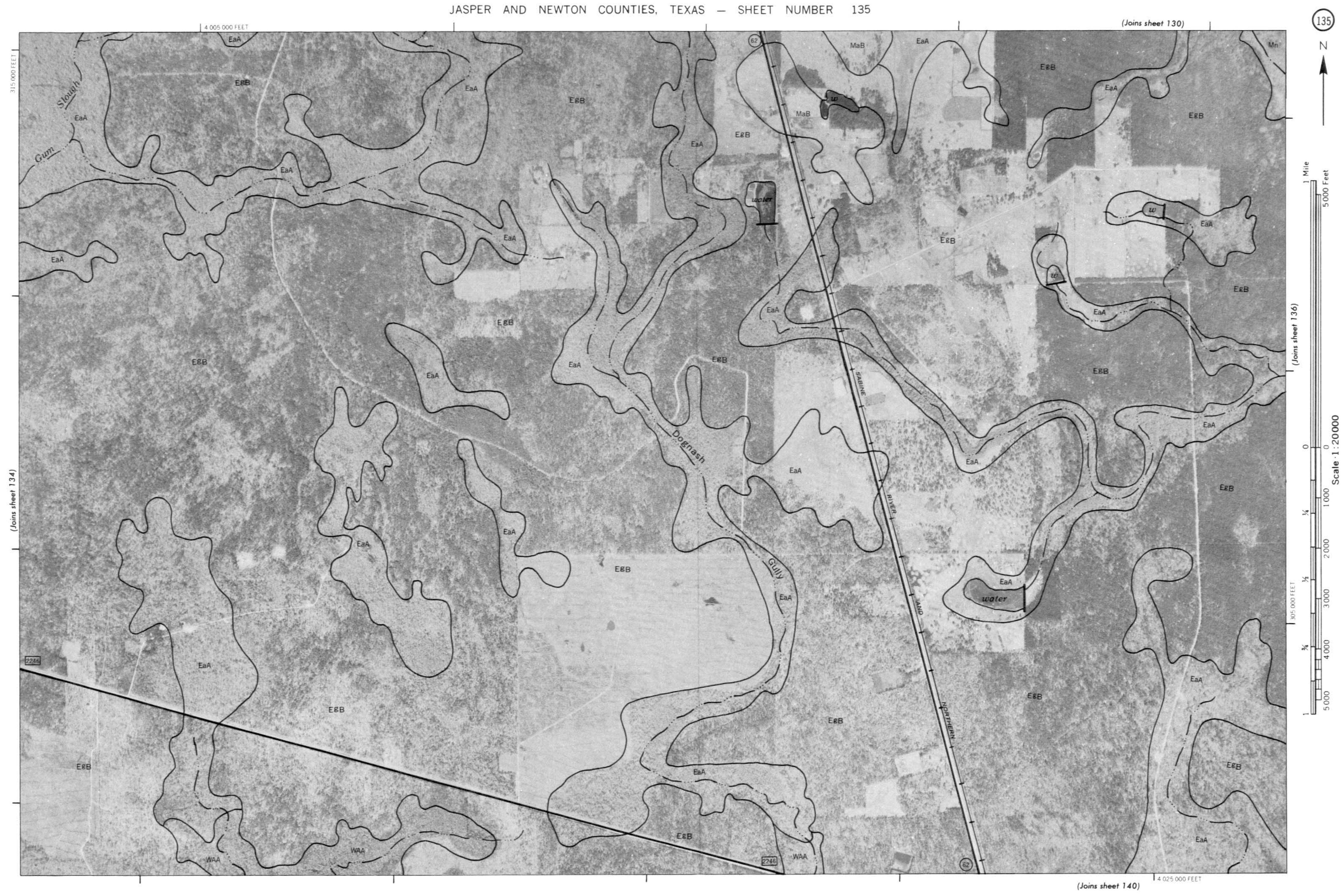

132
N
(Joins sheet 126)
4 070 000 FEET
335 000 FEET
(Joins sheet 131)
(Joins inset, sheet 115)
320 000 FEET
4 055 000 FEET
(Joins sheet 137)
1 Mile
5000 Feet
Scale 1:20000
0
¼
½
¾
1
0
1000
2000
3000
4000
5000
87
EvA
Gw
EgB
WAA
Little Cypress Branch
Nichols Creek
Black Marsh Slough
SMB
BaB
Um
Nichols Creek
CALCASIEU PARISH
LOUISIANA
SABINE RIVER
BeB
BIB
EaA
EvA

JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 133

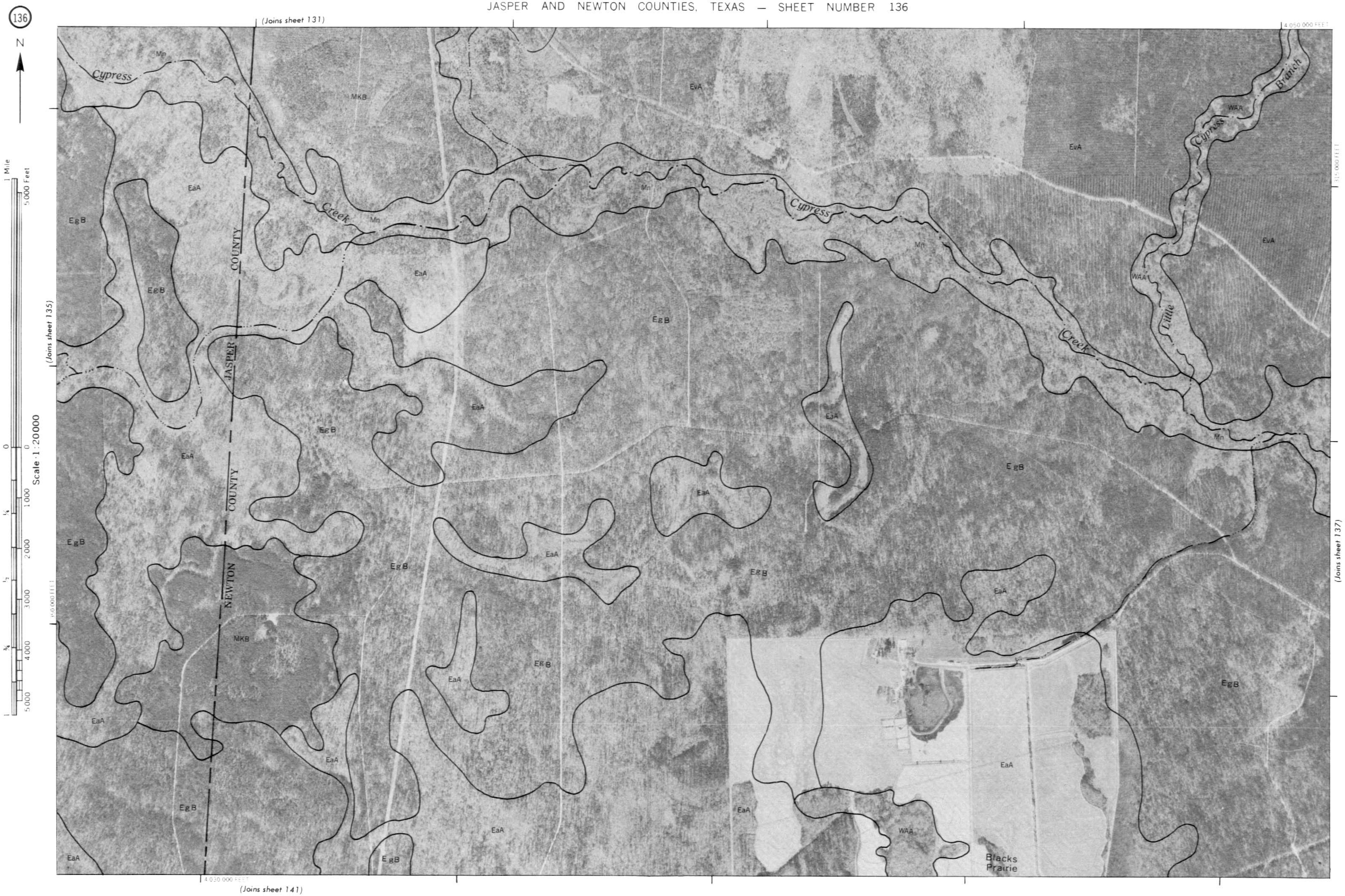



N
(Joins sheet 129)
(Joins sheet 133)
(Joins sheet 135)
(Joins sheet 139)
4 000 000 FEET
315 000 FEET
300 000 FEET
3 980 000 FEET
1 Mile
5000 Feet
Scale 1:20000
0
1000
2000
3000
4000
5000
¼
½
¾
1
Evadale
96
2246
1131
ATCHISON TOPEKA AND SANTA FE
Industrial Area
West Tenmile Creek
East Tenmile Creek
Gum Slough
Um
Ib
EgB
WAA
EdA
EaA
Gw

JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 135



JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 136



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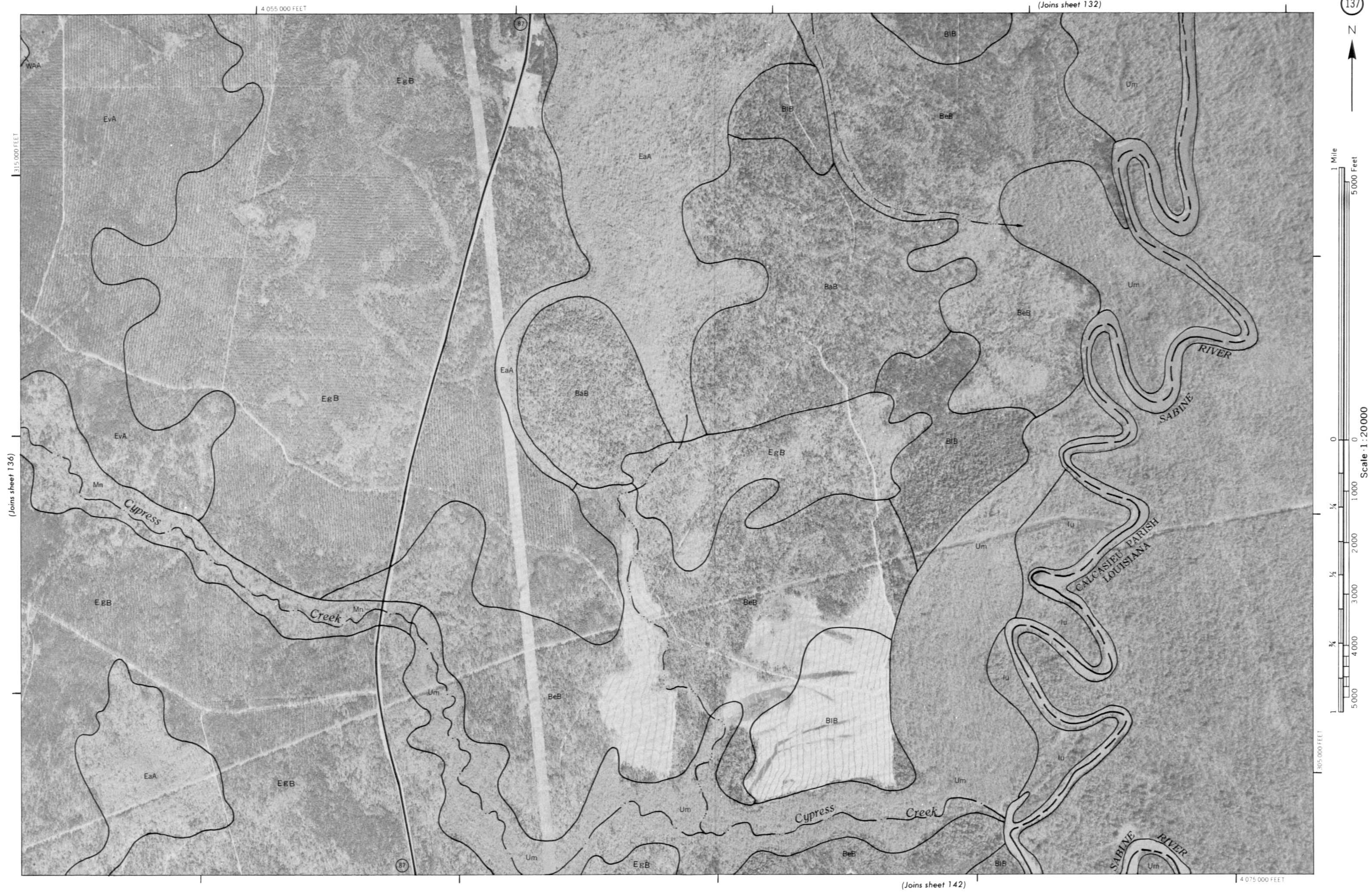

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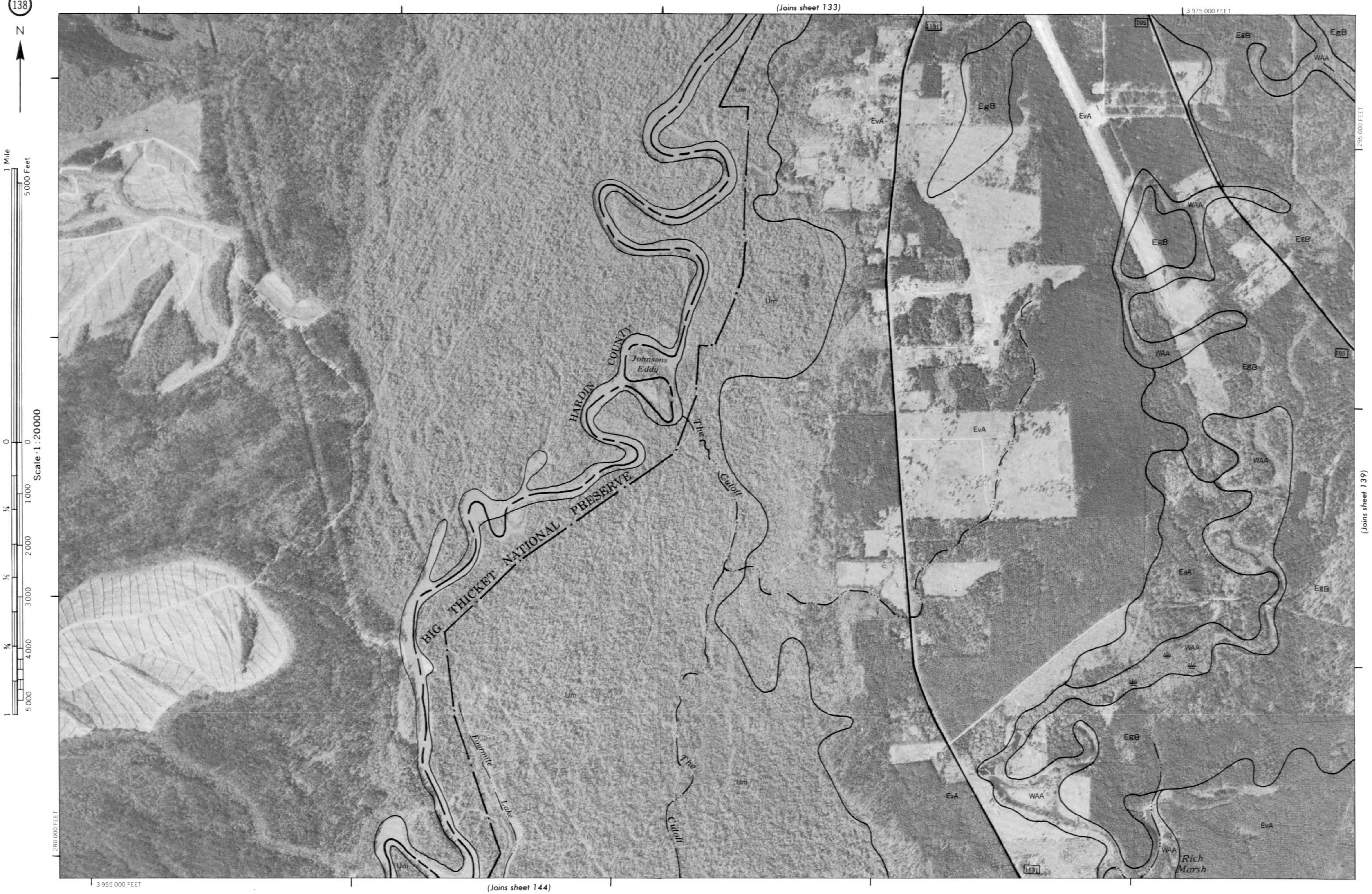
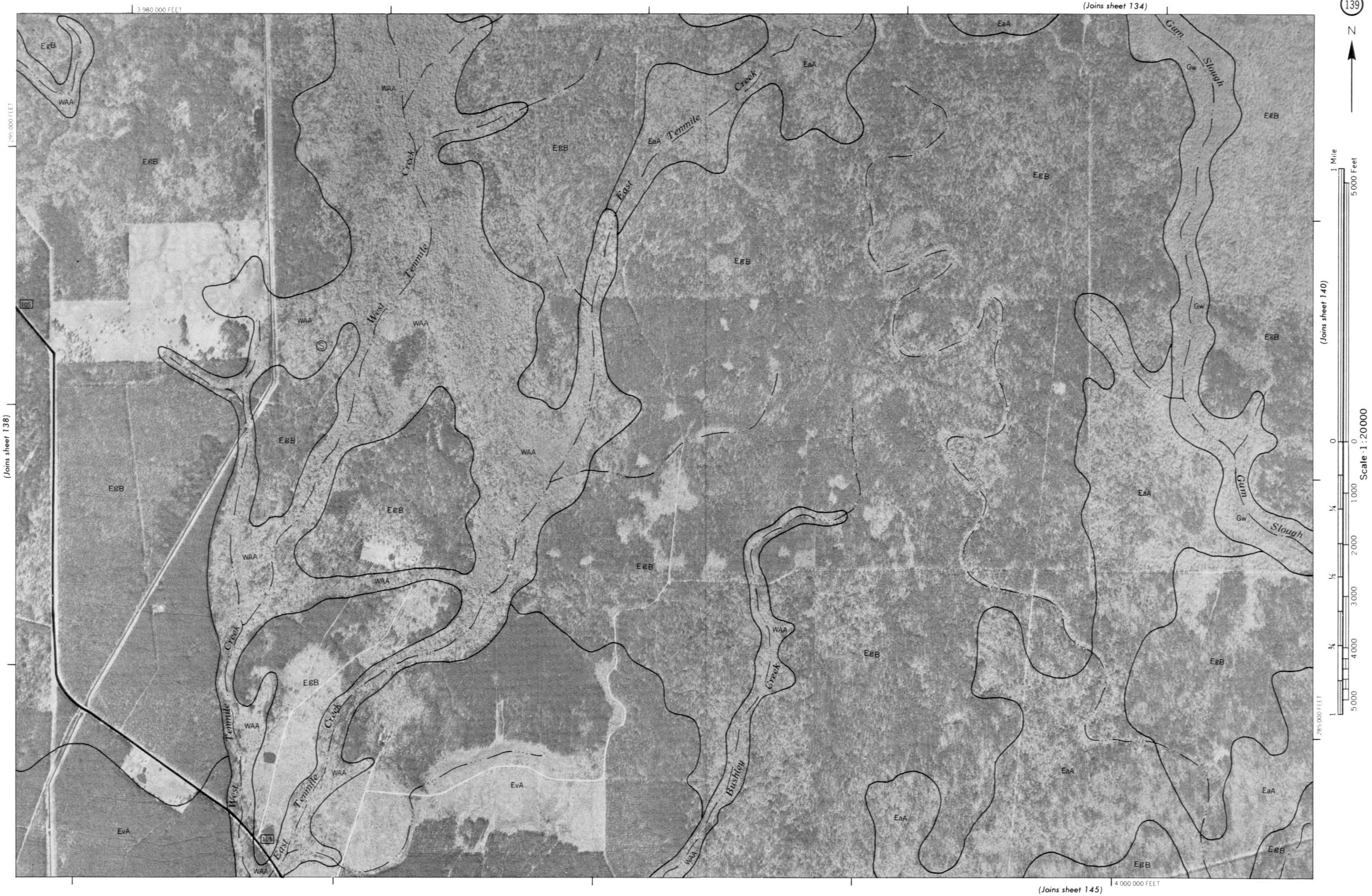
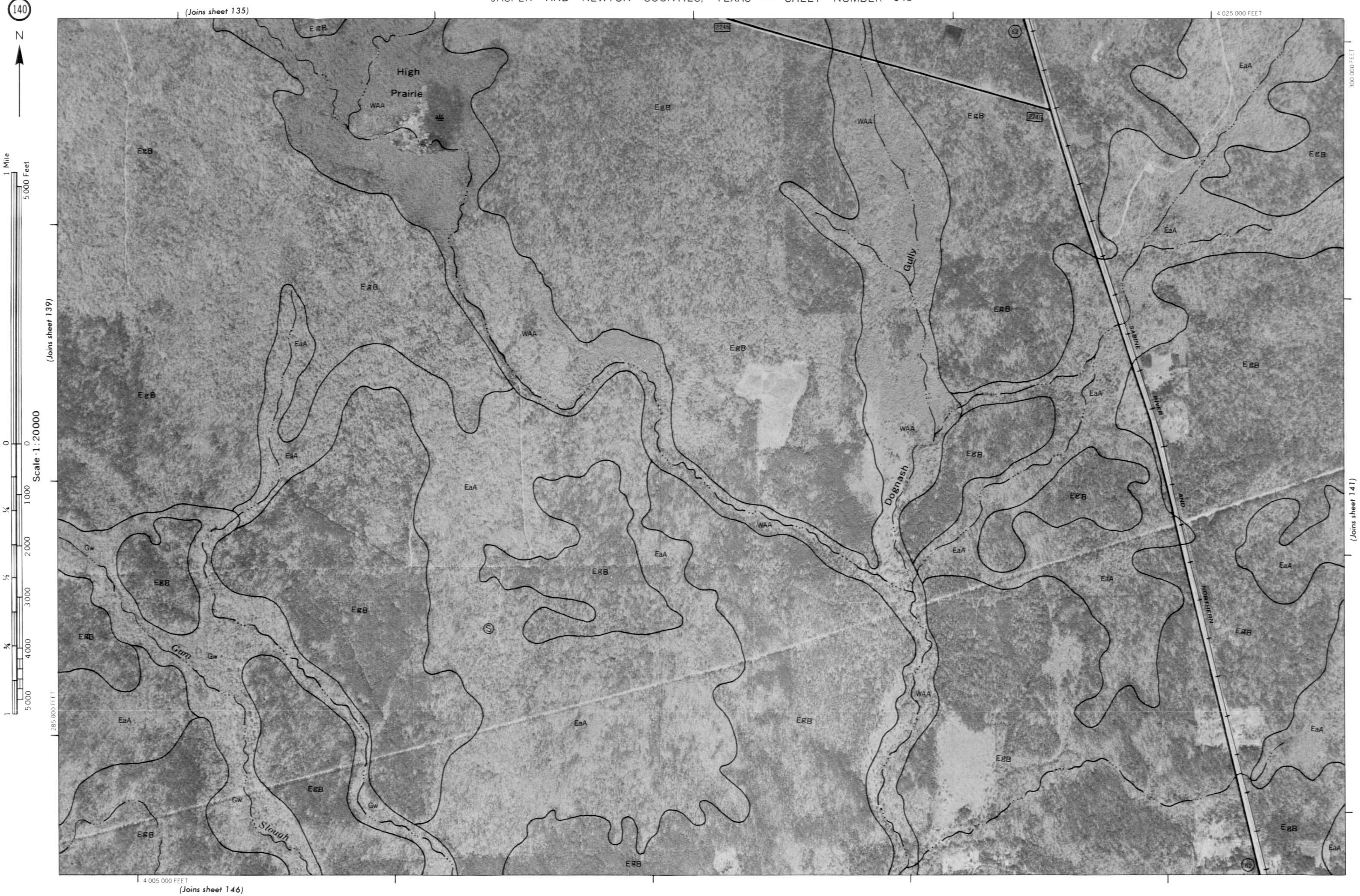
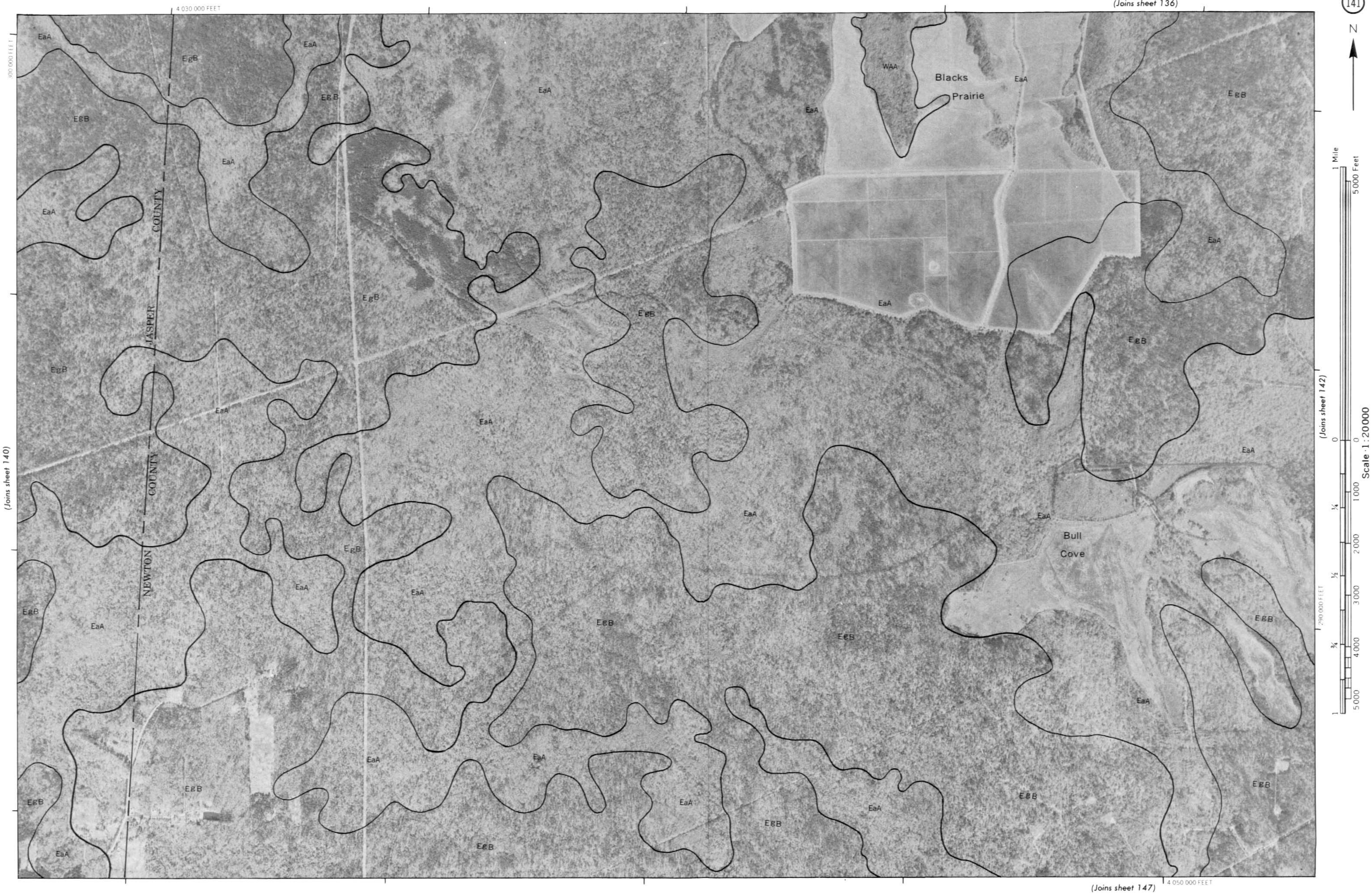


JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 139

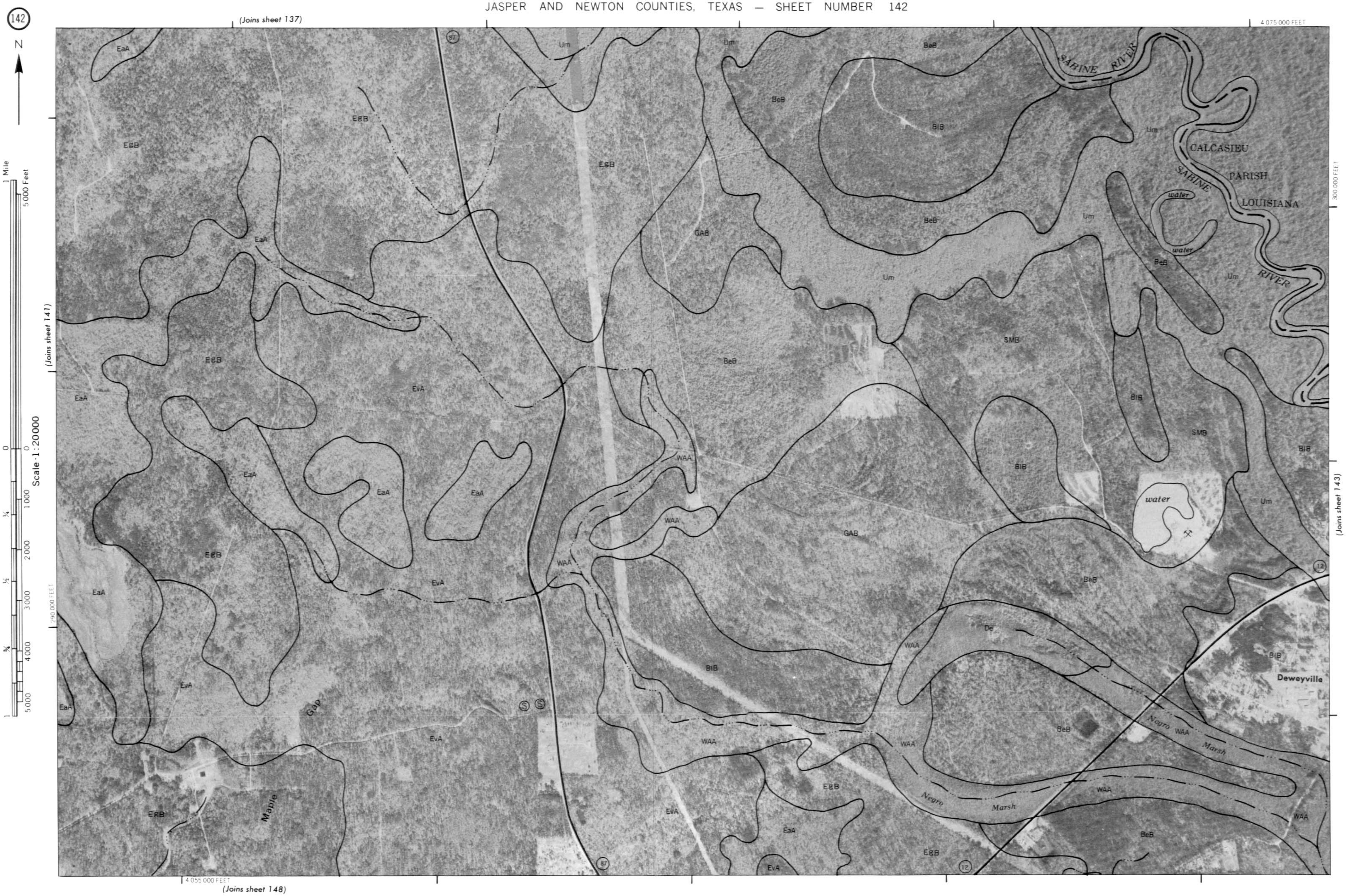


JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 140

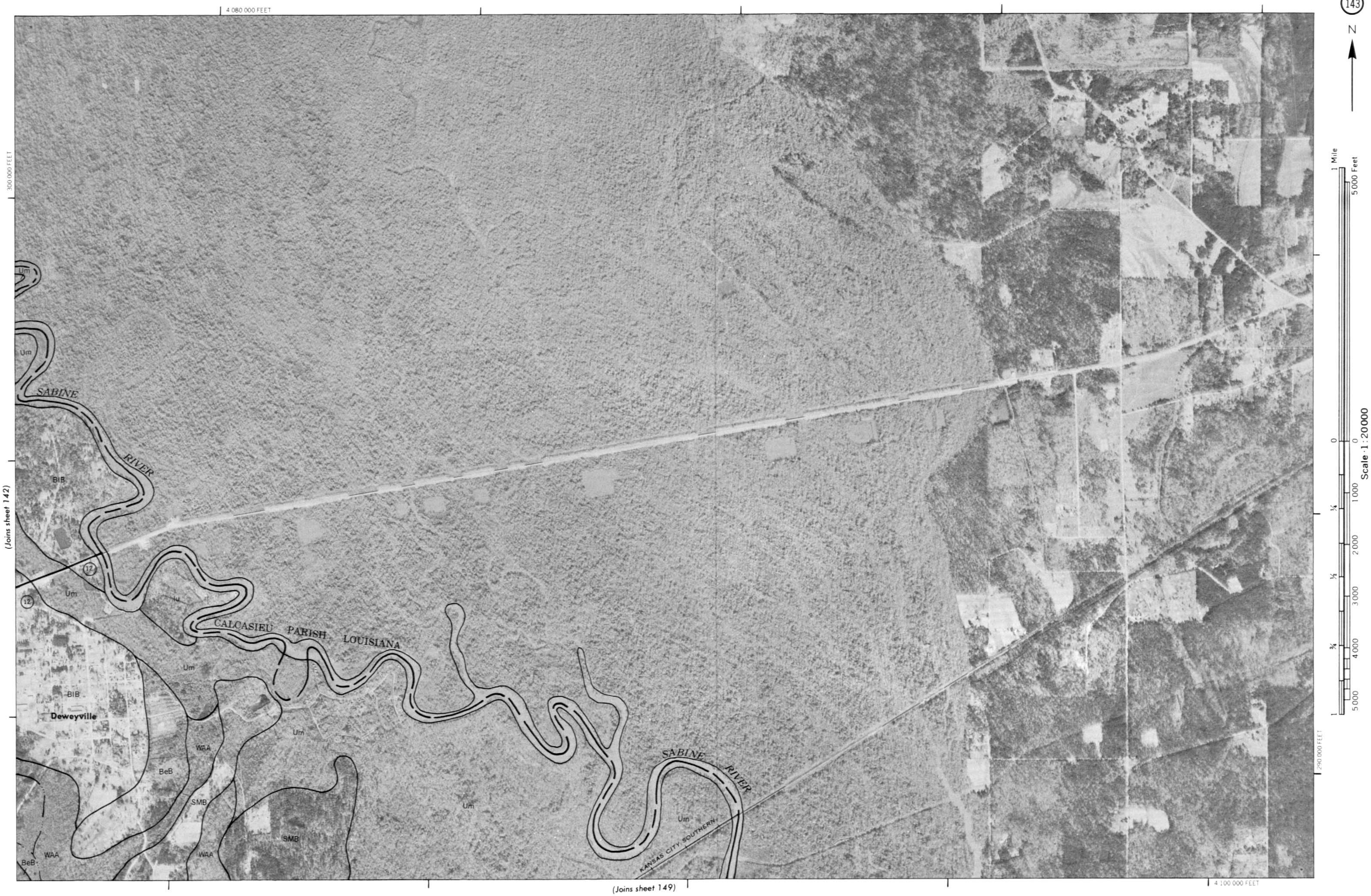



4 030 000 FEET
(Joins sheet 136)
N
300 000 FEET
(Joins sheet 140)
(Joins sheet 142)
(Joins sheet 147)
4 050 000 FEET
290 000 FEET
JASPER COUNTY
NEWTON COUNTY
Blacks Prairie
Bull Cove
EaA
EgB
WAA
1 Mile
5000 Feet
0
¼
½
¾
1
0
1000
2000
3000
4000
5000
Scale 1:20000

JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 142

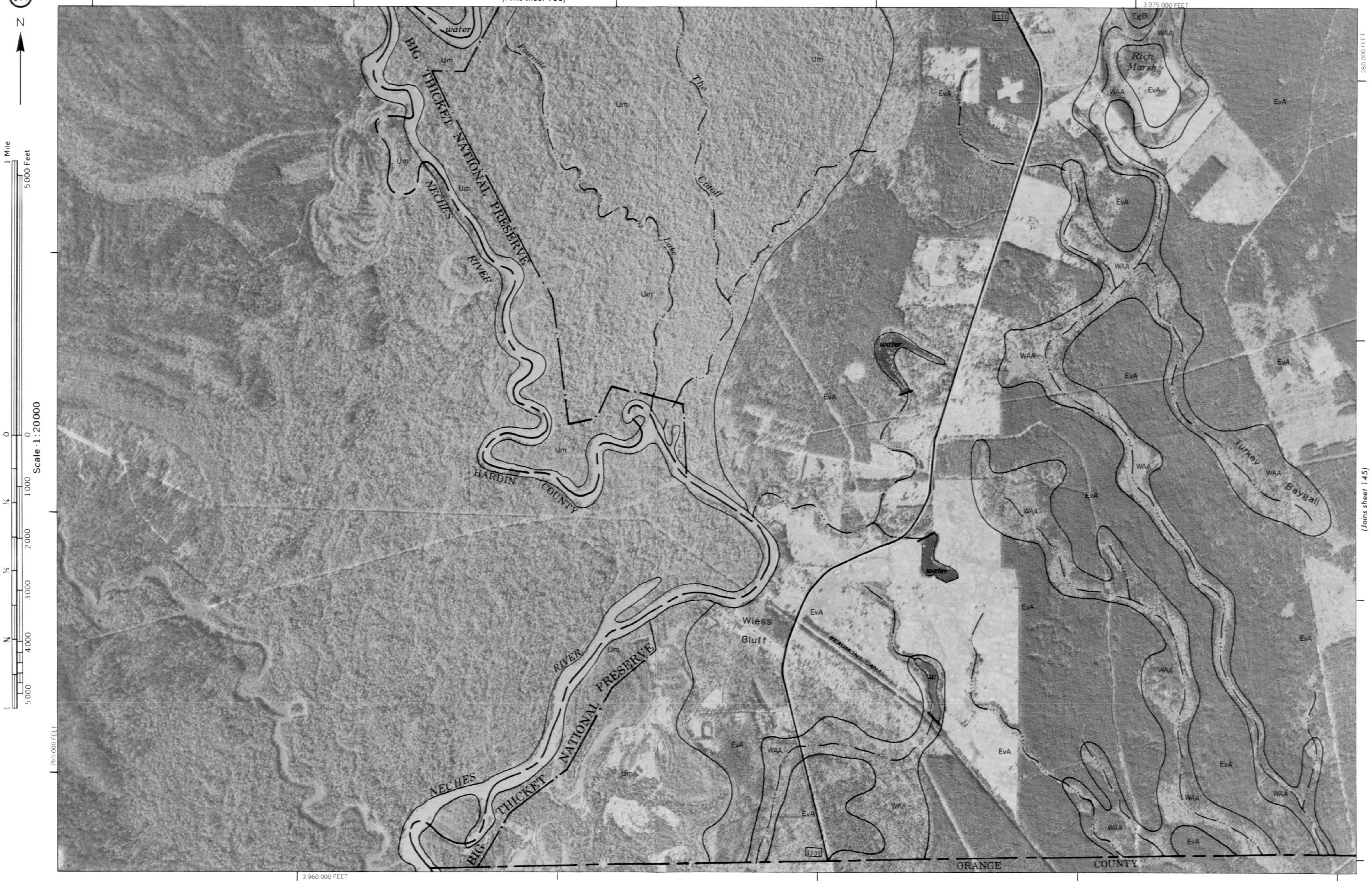


JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 143

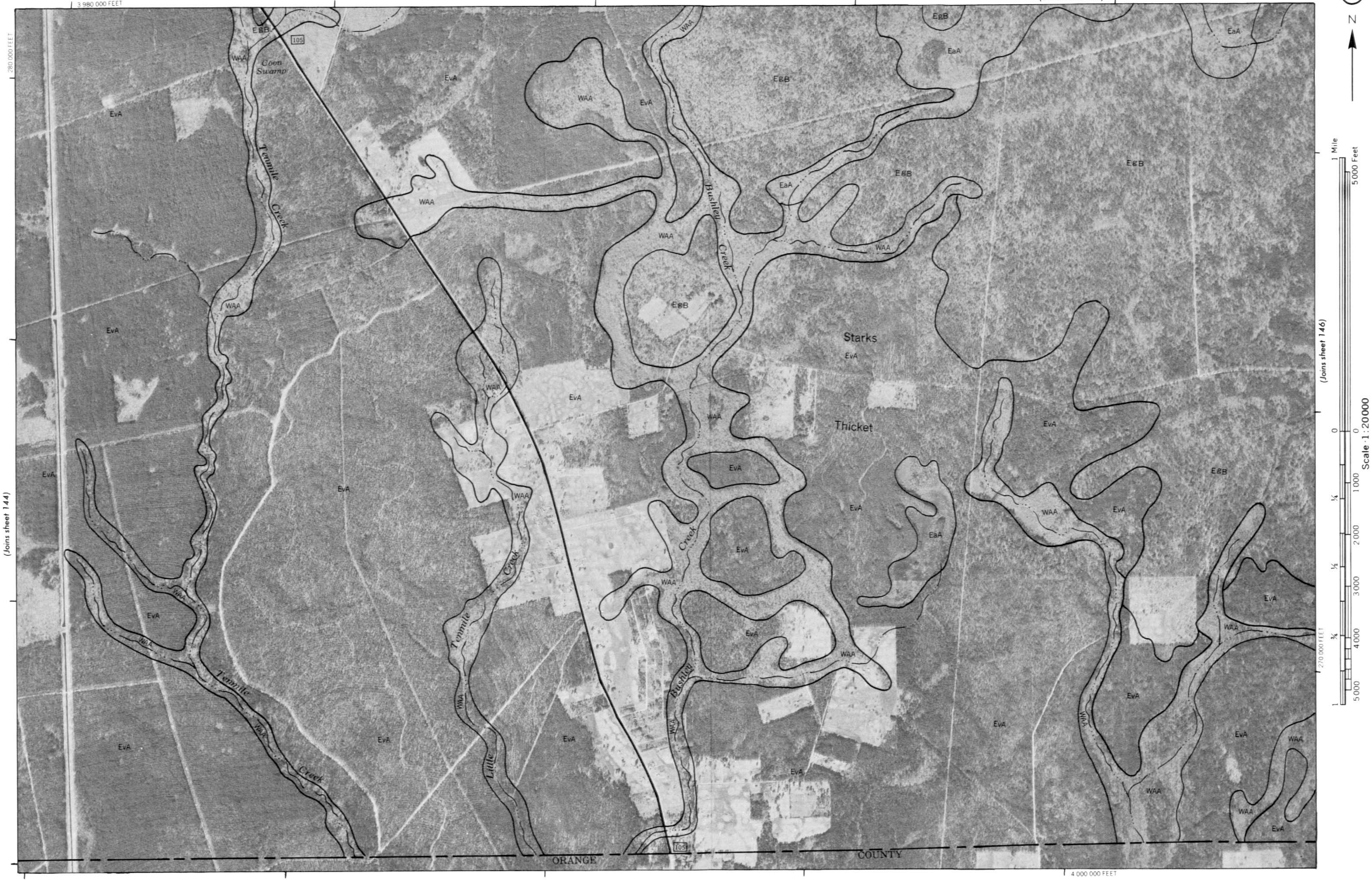


JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 144

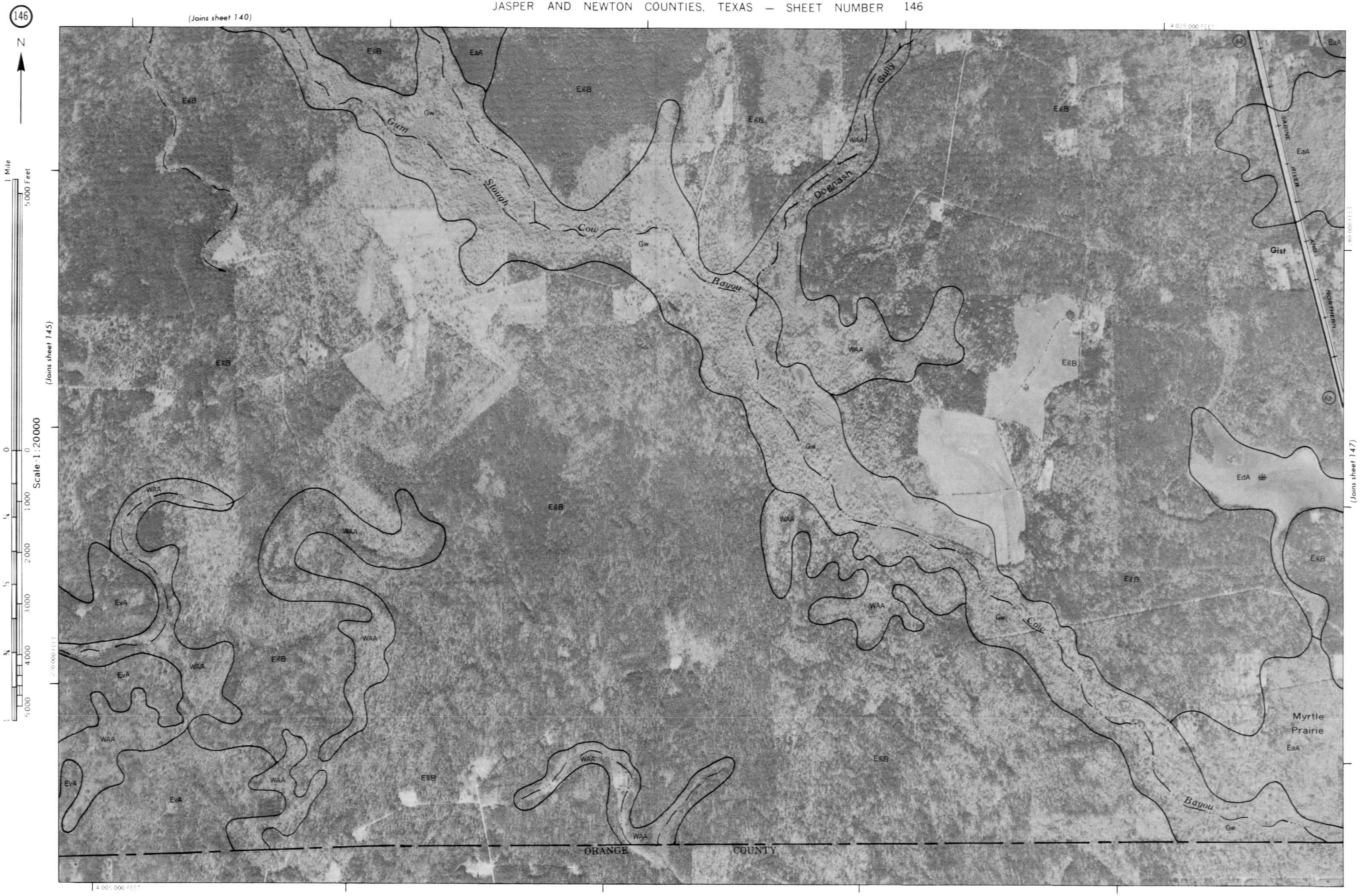
(Joins sheet 138)



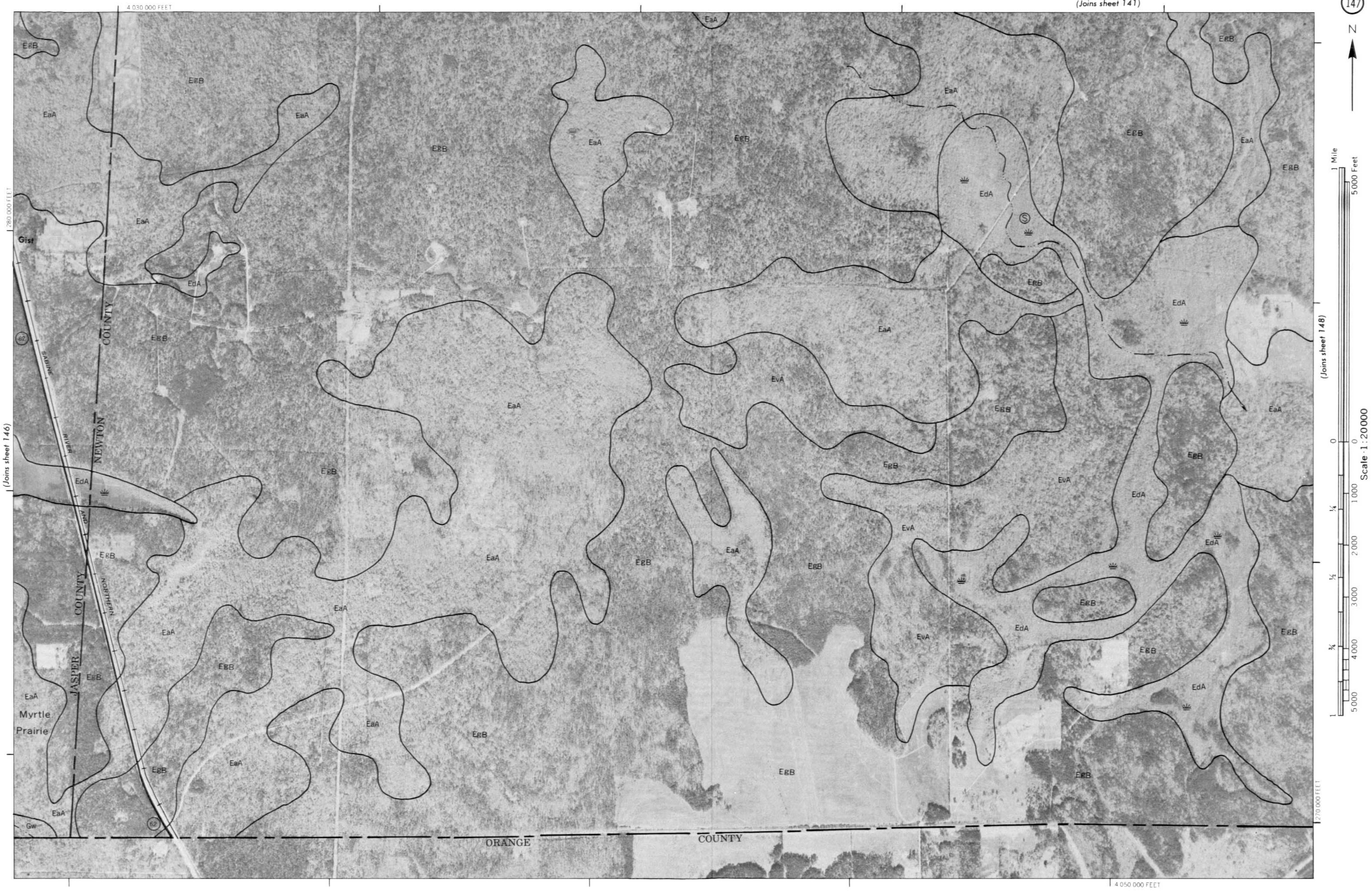
(Joins sheet 145)

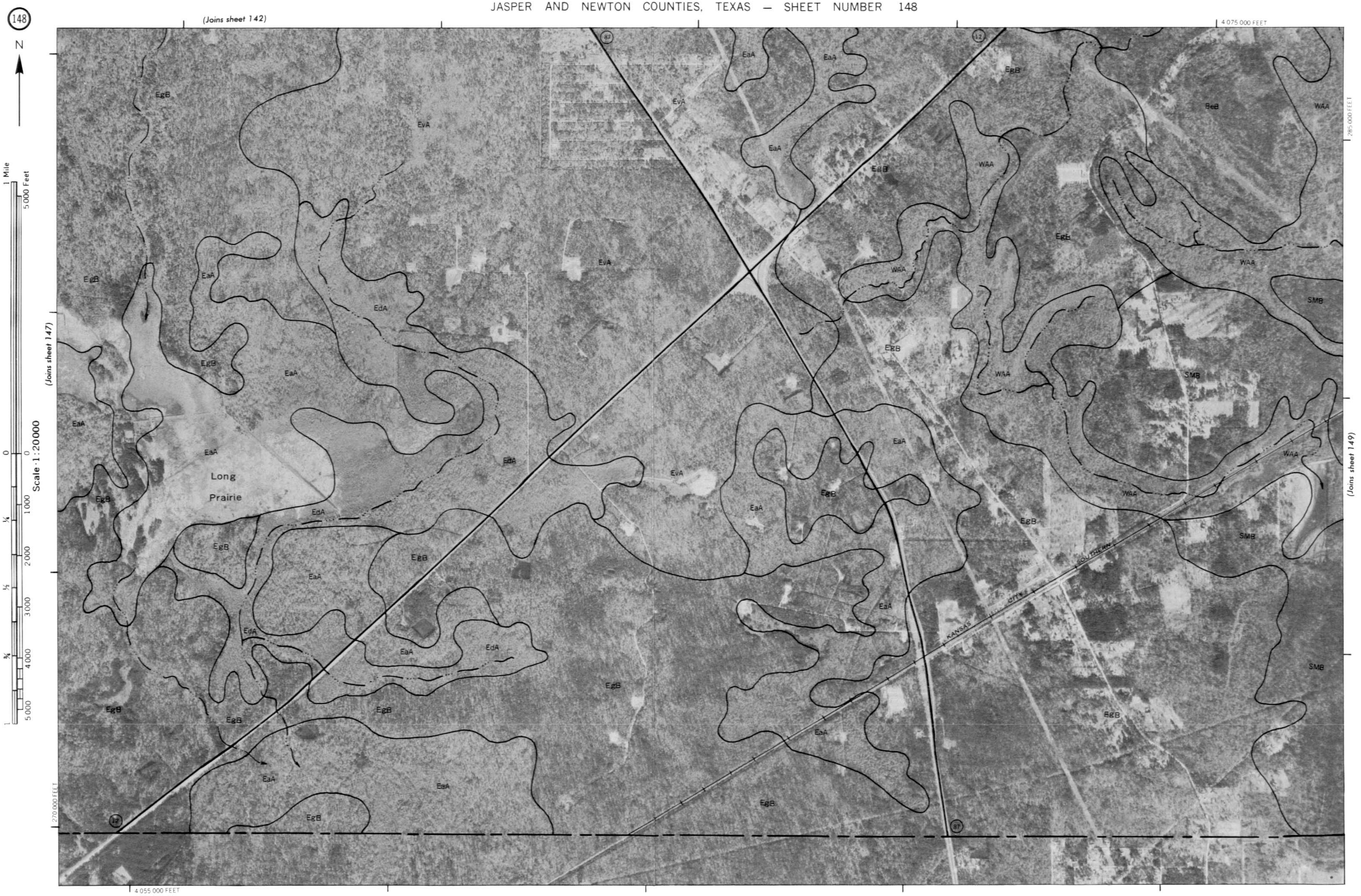

3 980 000 FEET
(Joins sheet 139)
280 000 FEET
(Joins sheet 144)
(Joins sheet 146)
270 000 FEET
4 000 000 FEET
N
Scale 1:20000
1 Mile
5000 Feet
0
¼
½
¾
1000
2000
3000
4000
5000
105
Coon Swamp
Tenmile Creek
Little Tenmile Creek
Bushley Creek
Starks
Thicket
ORANGE
COUNTY
EvA
EgB
EaA
WAA

JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 146



JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 147




148
N
1 Mile
5000 Feet
0
0
1000
¼
2000
½
3000
¾
4000
5000
1
Scale 1:20000
(Joins sheet 142)
(Joins sheet 147)
(Joins sheet 149)
4 075 000 FEET
285 000 FEET
270 000 FEET
4 055 000 FEET
87
12
12
87
EgB
EvA
EaA
EaA
EvA
EaA
EgB
BeB
WAA
EgB
WAA
EaA
EdA
EvA
EgB
EgB
WAA
WAA
SMB
EgB
EaA
EgB
WAA
SMB
EaA
EaA
EdA
Long
Prairie
EvA
EgB
EaA
WAA
WAA
EgB
EdA
EgB
EgB
EaA
SMB
EaA
EdA
EaA
EdA
KANSAS CITY SOUTHERN
SMB
EgB
EgB
EgB
EgB
EgB
EaA
EaA
EaA
EgB
EgB

JASPER AND NEWTON COUNTIES, TEXAS — SHEET NUMBER 149

(149)

(Joins sheet 143)

(Joins sheet 148)